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Y2K do-it-yourselfers
'Volunteers' find no fame, no fortune. **Careers, 70**

The endless project
The hardest data warehouse work happens after it's installed. **61**

Where are we?
Global positioning systems find their way into the business world. **66**

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Chrysler soups up data access

▸ *IT overhaul liberates production data worldwide*

By Julia King

CHRYSLER CORP. is throwing open the hood on its massive mainframe computer systems to give 2,000 business users point-and-click access to mountains of real-time manufacturing and production data.

BUSINESS INTEGRATION

In doing so, the $61 billion carmaker is extending decision-making capabilities well beyond the executive suite to business analysts, line personnel and just about anyone with an Internet browser.

The enormous effort integrates 21 mainframe transaction systems and users throughout the world, providing access to volumes of production data at a split-second pace that even large data warehouses can't handle.

"They're actually tuning their production line," said John Waraniak, an auto industry analyst at Benchmarking Partners, Inc. in Boston. "Giving more people access to the production line gives them a whole new way of looking at and adjusting their forecast because each one of those people touches the customer in a different way."

Chrysler, page 85

Call center reorg unites travel info

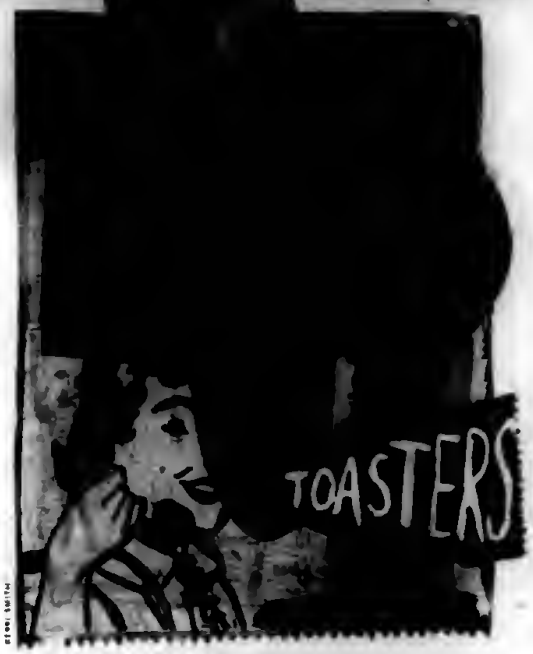
By Kim Girard

THOMAS COOK GROUP's latest adventure is expected to take one of the world's largest travel agencies on a trip into new technological territory, where the Web meets the call center.

Tomorrow's kickoff of Thomas Cook Global Services — to be introduced first in the U.K. and then in the U.S. next year — is intended to simplify life for customers by offering a single toll-free number to track all services. For Thomas Cook, that number and its Web site funnel all service requests, such as trip reservations and travelers' check orders, through one uber call center.

But it will be the technology behind the scenes that makes the new system work, providing a unified view of customer accounts and pending queries, whether they be via E-mail or telephone. Thomas Cook's new system will eventually turn each customer inquiry into an object that will be dropped into a database, enabling the company to track customer information collected on its Web site and through its call center. Agents

Call center, page 85



VOICE RESPONSE GOES PRIME TIME

By Barb Cole-Gomolski, Julia King and Carol Sliwa

Just say what you want, and it's yours. Need a new air conditioner to get through the summer heat wave? Call any one of 760 Sears, Roebuck and Co. stores, say the words "air conditioner" into the phone, and presto, you're connected to the major appliances department. Soon, consumers will conduct lots of other business the same way — from checking flight times to getting credit approvals to buying electronics — as voice recognition systems come of age. **Voice recognition, page 24**

By Jaikumar Vijayan **Wall Street firm Morgan Stanley, Dean Witter & Co. calls it "the chocolate chip cookie of servers — not sexy but still so good."**

AS/400 VITAL STATS

Unveiled:	1988
Installed base:	500,000 users
Systems sold per year:	60,000
1997 worldwide sales:	$3.35B

Source: IBM; Morgan Stanley, Dean Witter & Co.

To Bill Steadman, it's a "Web server, a Notes server, a Java virtual machine, an NT server, an OS/2 server, a firewall and a legacy application server." Ten years after its debut, IBM still calls it the AS/400. **AS/400, page 20**

Microsoft legal team prepares to pounce

By Kim S. Nash

MICROSOFT CORP. executives are fond of saying they don't worry much about the federal antitrust trial scheduled to start in September. They instead remain focused on building products, they claim, and repeat CEO Bill Gates' well-worn refrain that Microsoft is merely fighting for the future of the computer industry.

But behind the scenes, an estimated 70 people — including in-house and outside lawyers, assistants and advisers — are consumed by the company's legal problems.

With less than two months until the Sept. 8 tri-

Microsoft, page 84

Bill Neukom leads Microsoft's legal charge

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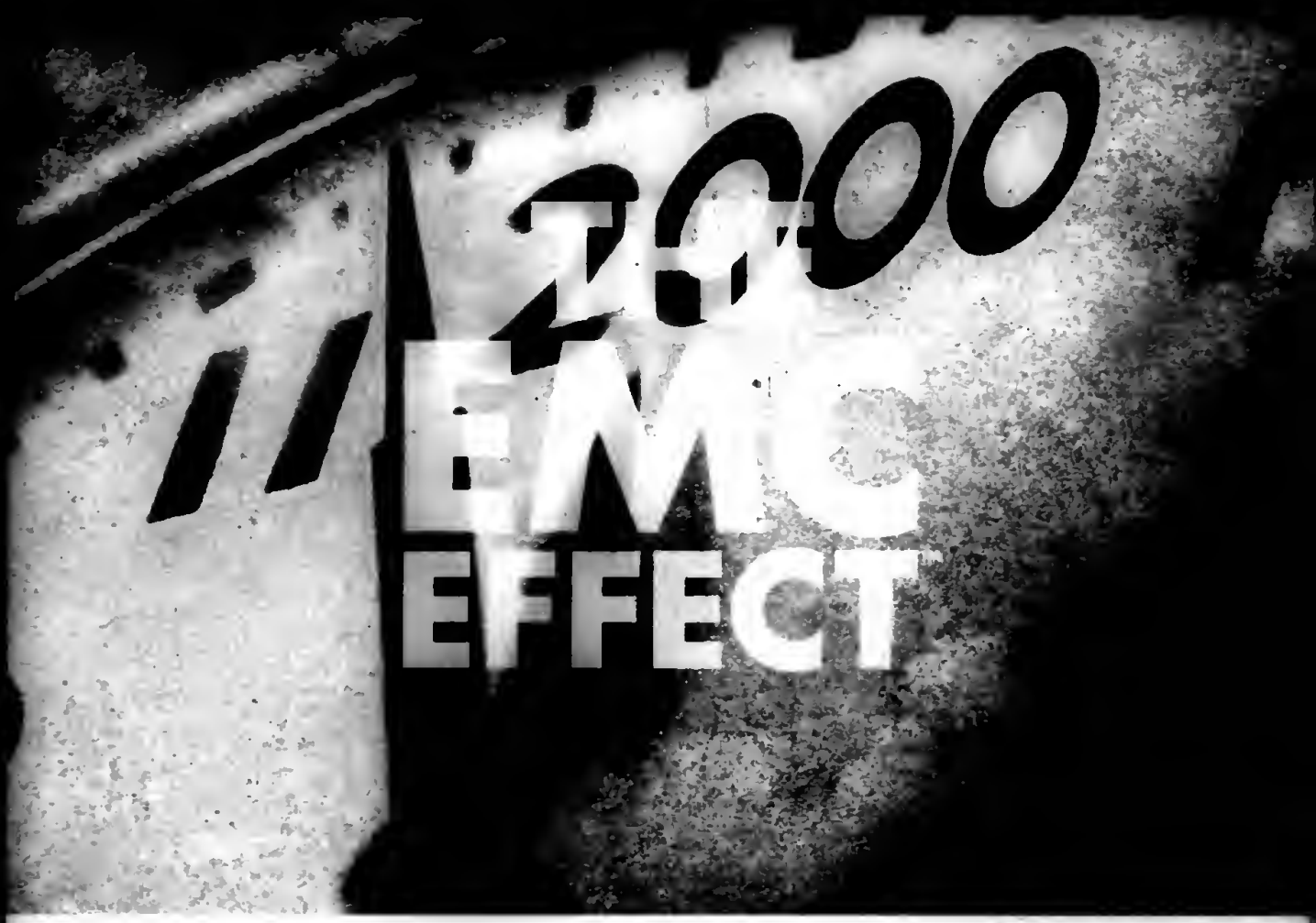

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Moving money can be the hardest thing about reconstructing a factory, says Tim Stauder. **Corporate Strategies, page 35**

In a CW interview, open systems guru Eric Raymond says publishing source code is the best way to develop software. **In Depth, page 68**

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Public companies are prepared for year 2000, Merrill Lynch study shows. **16**

U.S. companies fret that their year 2000 work will be wasted by lack of preparedness in telephone carrier networks overseas. **17**

User group hires consultant to test carrier compliance, but tests are limited. **35**

Year 2000 fails as a windfall to IT people, who don't reap the riches they expected. **70**

EXECUTIVE

Briefing

■Stop worrying you'll have to spend a lot of money to hire specialists to fix year 2000 problems. There aren't any specialists to hire. If they aren't already making big bucks as consultants, they just aren't available. So most organizations just parcel out the year 2000 work to existing staff and hope for the best. Page 70.

■A new call-center approach due to debut from Thomas Cook this week demonstrates that companies can't structure customer service groups according to products anymore; customers want one-call service for all their dealings with a company. Page 1.

■Voice recognition can improve customer service, too, making it easier for customers to get the information they need from brokerages, department stores and almost anywhere else. Page 1.

■The Sabre travel reservation company angered customers with a proposal to warehouse data on 50 million travelers and then sell it. Customers worry about abuses of privacy; Sabre promises not to sell names. Page 6.

■A group of users hired consultants from Bellcore to test whether regional Bells have fixed year 2000 problems. But there are too many pieces included to be really sure the networks are secure before the deadline. Page 47.

■Bridgestone Firestone rolled out an extranet to give its dealers more information and better service. It worked, according to dealers. Saab is doing much the same thing as part of an overall drive to improve customer service. Page 41.

■Data warehouses require a constant influx of new data, and users demand changes as they find new ways to use the systems. The tools techies think are simple may not be. Page 61.

■We reviewed three global positioning systems that all worked pretty well. But to be just right for the traveling executive, they have to be more comprehensive, detailed and easier to use. Page 66.

■Federated Department Stores is pushing its suppliers to switch to electronic bills of lading to make its own paperwork faster and cheaper. It doesn't do some of the suppliers much good, but they go along to keep the customer happy. In August, Federated will charge more to the suppliers who haven't switched. Page 41.

■CoolMail and a few other products will collect your E-mail and read it to you over the phone. It helps one Ernst & Young consultant keep up on messages when she's on the road and can't find a place to plug in a laptop. Page 47.

■Norfolk Southern Railway revolutionized freight operations with a system that automated its paper-shuffling process for tracking cars, containers and loads. Now it's upgrading the system and extending it to small railyards. Page 8.

Can PeopleSoft keep up the pace?

Despite great financials and a string of acquisitions, some doubt the knockout numbers can continue

Online this week
www.computerworld.com/more

Labor gap may drive mergers

By Thomas Hoffman

FORGET COST SAVINGS and geographic expansion. The next wave of mergers, according to two prominent researchers, will be driven by the IT labor shortage and the battle for top talent to develop strategic applications that generate competitive advantage.

Those views have become a hot debate topic because information technology staffing issues have historically not topped the agenda at corporate board discussions.

"We think the [IT] labor shortage is permanent and will force [companies into] mergers and acquisitions to achieve efficiencies in software production," said Avron Barr, co-director of software research at the Stanford Computer Industry Project in Stanford, Calif.

Barr, who delivered his prediction at The CIO Forum, a recent conference attended by 300 financial services chief information officers, isn't alone in his beliefs.

The year 2000 problem and the skills drain related to a switch to a unified European currency are gobbling up scarce software resources. Those global projects, combined with the IS labor shortage, "will accelerate mergers and acquisitions," said Capers Jones, chairman of Software Productivity Research, Inc. in Burlington, Mass.

The labor issue will become critical to small and midsize banks' competitive edge

– Austin Adams, First Union

However, naysayers insist that the IT labor problem isn't being addressed by CEOs and outside directors where merger discussions are shaped. And they cite the banking industry as one example.

"For banks, I think the labor shortage is a relatively small factor compared to [the impact of] national reach," said Harris Miller, president of the Information Technology Association of America. In January, the Arlington, Va.-based industry group estimated that there was a shortage of 346,000 IT workers in the U.S.

In theory, merging banks can slash 30% to 40% of their application development costs once a deal is completed, said Octavio Marenzi, research director at Meridien Research, Inc., a Newton, Mass.-based financial services consultancy.

But in reality, merging banks "spend more to integrate systems after a merger, and the expected cost savings are often elusive," Marenzi said. He pointed to Wells Fargo Bank's $11.3 billion acquisition of First Interstate Bancorp in 1996, where he said multiple systems from both banks remain in operation.

However, there are anecdotal examples of recent mergers and acquisitions where IT played a significant role. The most prominent is Charlotte, N.C.-based First Union Corp.'s $16.3 billion acquisition of CoreStates Financial Corp. in November (CW, Dec. 1, 1997).

Philadelphia-based CoreStates put itself on the block when it realized a bigger bank such as First Union would be better equipped to tackle its year 2000 problem, said CoreStates officials at the time of the acquisition.

First Union CIO Austin Adams said he believes the industry labor shortage will play only a minor role among big banks as they look at merger and acquisition criteria. The labor issue will become more critical to small and midsize banks "as they look at systems development to help them remain competitive," he said.

Howard Rubin, an analyst at Meta Group, Inc. in Stamford, Conn., said more companies will be forced to outsource "commodity" functions such as help desk support in order to place existing IT staffers to develop strategic software applications. Companies "that can't afford to play the game are more likely to go with wholesale outsourcing" before merging, Rubin added. □

MORE ONLINE

For past articles on the IS labor shortage, visit *Computerworld online*. www.computerworld.com/more

Teens eyed as IT labor option

▸ *Young workers filling more programmer slots*

By Barb Cole-Gomolski

IN THE ONGOING struggle to fill open information systems jobs, desperate companies are opening up to a new source of talent — teen-agers.

Enthusiastic, determined and adept at computers, these young recruits have appeal because they are willing to take on mundane IS chores, often for $8 to $10 per hour.

Ravi Sarin, 16, working this summer at Nomatix, says, "anybody with the talent can do the work"

But it is a risky proposition. Employment experts warn that hiring teens may prove little more than a short-term fix. The young workers tend to get put into programming because of their lack of experience and are more likely to get bored and leave in short order, experts said.

In addition, employers must deal with the fact that teen-agers don't always understand business protocol.

Still, more and more teens are being hired as programmers, World Wide Web site designers and system administrators.

According to the U.S. Department of Labor, the number of computer programmers and systems analysts age 16 to 19 increased from 9,000 in 1996 to 16,000 in 1997. Federal regulations limit the amount of time teen-agers can work, but those restrictions apply only until the worker turns 16.

In most cases, teens are working part time or in summer jobs, but the corporate lure is so strong that some students are foregoing college and accepting permanent IS positions.

Teens are reading about the IS labor shortage and seeing the opportunity to make $30,000 to $40,000 per year without completing college, said Guy Smith, director of the multimedia lab at Santa Barbara State College in California.

Smith said he sees "an enormous flux" in and out of the college's program, which prepares students for careers in Web site design. "Students will take a few classes, then disappear," he said.

Hiring a technical whiz kid can pay off if the recruit has a special talent, employers said.

David Rosenfeld, director of software engineering at Nu Thena Systems, Inc., a software developer in McLean, Va., hired Doug Marcey, 17, to do programming, Web site development and systems administration because he felt Marcey was an exceptional talent. "If I hadn't hired him, somebody else would have," Rosenfeld said.

BACKDOOR HIRES

Rosenfeld and others said they aren't actively recruiting at high schools. Teen-agers typically land their IS jobs because they know someone at the company or apply for some other type of work at the firm and then move into IS.

Marcey works three days per week at Nu Thena, earning "about $25,000" and takes classes two days per week at George Mason University in Washington.

Similarly, Ravi Sarin, 16, is spending his summer programming and doing Web site development work at Nomatix, a start-up network equipment manufacturer in Santa Monica, Calif. Sarin landed the job when he applied for an internship with a college professor, who happens to own Nomatix. Sarin is the only teen-age employee at the company, but he said he doesn't feel any different from his colleagues. "This industry is an equalizer," Sarin said. "Anybody with the talent can do the work."

Although teens have appeal because of their aptitude for computers and enthusiasm, employment experts cautioned that companies shouldn't look to teen-agers as a major source of IS talent.

"Most people don't want to be programmers forever," said Eva Fujan, vice president of technical recruiting at Inacom Corp., a large systems integrator in Omaha. Inacom has a scholars' program through which college students work as interns and are offered jobs upon graduation. The company prefers this method over recruiting high-school graduates because it believes the broad-based knowledge of a college education is needed to move up in the organization, Fujan said.

Marcey agreed that a college degree is a worthy pursuit even for someone like him. "A lot of high school kids can do systems administration, but not a lot of kids can be software engineers," he said. □

SEEKING YOUNG AMERICANS

Advantages and drawbacks of hiring teen-agers

PROS

- Many have a strong aptitude for computers
- Are enthusiastic about their jobs
- May demand less pay than college-educated counterparts

CONS

- May get bored with the programming jobs they tend to land
- Lack business experience
- May not be used to working in teams

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Sabre in privacy hot seat

By Stewart Deck

THE SABRE GROUP wasn't prepared for the firestorm it caused when company officials last week started talking about building a data warehouse of its travel reservation information and then selling some of that data to outside agencies.

Amid the uproar, a Sabre spokeswoman said the company does not and would not sell passenger names to third parties without the traveler's consent.

More than 50 million travel reservations pass through the company's system each day.

Several users chiming in about the Sabre issue on the Internet newsgroup rec.travel.air expressed anger.

"This has to be one of the most remarkably insensitive and naive proposals I have ever heard," thundered one user. "A commercial firm with no contractual tie to fliers (only to airlines and travel agencies) plans to routinely market private information about the travel plans and personal preferences of individual citizens who fly."

Jennifer Hudson, a Sabre spokeswoman in Houston, said the comments were erroneous speculation, although Sabre declined to provide details about the scope of its data warehousing project or when it would be implemented.

"We are working on a data warehousing project that involves the use of data in our system, and we're looking at what business opportunities may exist with that project," Hudson said.

She said Sabre complies with all privacy regulations in the U.S., the European Union and the rest of the world and will continue to do so.

CONSUMER RIGHTS

But online privacy advocates remain wary. "This is another startling example of why self-regulation doesn't work," said Dave Banisar, staff counsel at the Electronic Privacy Information Center in Washington. "There's a need for the consumer to have enforceable rights rather than being left at the whim of this company over what will be done with their personal information." □

Bank targets ROI for reusable objects

▸ *First Union tries internal 'vendor' technique*

By David Orenstein

FIRST UNION CORP. is betting that an entrepreneurially structured internal development team can improve its use of object and component technology.

The nine-member Distributed Object Integration Team, called DO IT, at the Charlotte, N.C., bank acts like an independent software vendor that develops and "sells" Common Object Request Broker Architecture (CORBA)-based components to application developers in the company's business units, said Bill Barnett, distributed application technology manager.

The components use CORBA to allow incompatible programs or objects to run and interact across a disparate enterprise.

Because it charges licensing and other fees, the DO IT team has a bottom-line incentive to develop components that are reusable and easy for internal customers to integrate.

Meanwhile, the team's financially based performance benchmarks could give First Union a better sense of its return on investment (ROI) in object technology. Companies have long struggled to calculate their ROI from reusable objects, but First Union's approach could finally show it, said Karen Boucher, an analyst at The Standish Group International, Inc. in Dennis, Mass.

FIRST UNION'S MARKET APPROACH

First Union Corp., Charlotte, N.C.
1997 assets: $157.27 billion
1997 net income: $1.89 billion
Employees: 44,000
Project: First Union's Distributed Object Integration Team acts as an independent software vendor to the company's business units, "selling" reusable components and objects for use in applications. The quasi-market approach could improve the company's use of object technology.

To determine its own value, the team will compare how much money its components have saved First Union with what the company has invested in the team. It also will weigh its licensing, support and other revenue against its costs. The program is too young for results to be tallied, Barnett said.

First Union's entrepreneurial approach is rare but not unheard of, Boucher said. BankAmerica Corp. and Thompson Publishing Group also have created market-oriented internal development units.

Part of the reasoning behind First Union's formation of the DO IT group was to encourage wider use of components. Thus, part of the team's job is to make the process less risky for business units.

SWEETEN THE PILL

The DO IT group buffers corporate developers from the server-side plumbing. That way, the team can make new uses of component technology easier to stomach, Barnett said.

The DO IT group recently inked its first deal for the reuse of a component, Barnett said. The product, called Customer Central, lets salespeople in First Union's insurance division — and soon in the commercial banking division — access and update customer records on a mainframe through their Windows 95 or Windows NT PCs.

The component was designed to operate so transparently that users don't have to know that they are working with a mainframe through CORBA, Barnett said.

The component also was designed to run around the clock at the company's 6,000-user retail banking call center. That reuse deal hasn't closed yet, however.

The CORBA component was built with Inprise Corp.'s Visibroker. One version uses a CORBA Microsoft Corp. Component Object Model bridge, called Object Bridge, by Visual Edge Software Ltd. in St. Laurent, Quebec.

Over time, Barnett said, the team will develop many examples to demonstrate the value of reuse. □

MOREONLINE

For articles, books, FAQs, tutorials and more on CORBA, visit *Computerworld online.*
www.computerworld.com/more

Netscape's Java virtual machine plan sketchy

▸ *Company still uncertain how new system will work*

By Carol Sliwa

DEVELOPERS WHO want their end users to have easy access to the latest and greatest Java technology in Web browsers face new barriers.

No longer in the business of making the Java virtual machines (JVM) that interpret Java code, Netscape Communications Corp. will rely on third-party vendors to "wrapper" those JVMs to plug in to its Open Java Interface. But six months after that announcement, the company is still sparse on details.

JAVA TECHNOLOGY

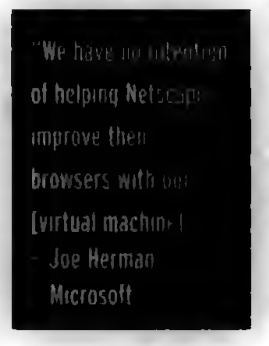
And rival JVM maker Microsoft Corp., which last week got Apple Computer, Inc. to commit to Microsoft's JVM for the Mac OS, said it doesn't have any plans to support Open Java Interface.

"We have no intention of helping Netscape improve their browsers with our [virtual machine]," said Microsoft group product manager Joe Herman.

The Open Java Interface won't be ready until the release of the Communicator 5.0 groupware/browser client, whose public beta release isn't due until year's end, said Netscape group product manager Eric Byunn. At that point, other JVM makers — whether operating system or tool vendors — will have to come through for Netscape.

Byunn said he can think of five JVM makers that write to the Win32a platform (which includes Windows 95, 98 and NT 4.0). But the company declines "to announce any of the partnerships we may or may not have," he said.

One Win32a JVM maker, Sun Microsystems, Inc., has been working with Netscape on the Open Java Interface. "As creators of the technology, we have a high incentive to ensure this thing is running flawlessly in Win32," said Gina Centoni, a group manager in Sun's Java software division.



But whether users will get the JVM the way they do now — as part of their Netscape browser installation — remains unclear.

Byunn said he is not sure yet how the system will work. He pointed to Macromedia, Inc.'s Flash multimedia player as a possible example. Netscape plans to bundle Macromedia's Flash player so users won't have to download a separate plug-in.

Another possible method will be triggering the JVM already on the machine, be added.

"We are not going to create a problem for our users," Byunn said. "We will deliver a working solution to our users." But Netscape will have to work on getting JVMs for 16 platforms, and the system could work differently, depending on the platform, Bryunn acknowledged.

Even if Netscape doesn't bundle a JVM, corporations that set their end users' desktop configurations shouldn't have a problem.

But for unsophisticated users "to have to download more than one thing is going to be too much," said Scott Milener, CEO of Java tools maker BulletProof Corp. in Los Gatos, Calif. □

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Oracle app business still sluggish

▸ *Exec reshuffling follows poor revenue showing*

By Craig Stedman and Stewart Deck

AS LARRY ELLISON'S hands-on work under the hood of Oracle Corp.'s applications business stretches into its sixth month, the company is still looking for ways to jumpstart the software's stalled sales.

CEO Larry Ellison took a hands-on role in Oracle's applications business six months ago but hasn't been able to spark sales growth

Ellison, Oracle's chairman, got directly involved in application development and marketing early this year (CW, March 30). Company officials say he has already helped by making sure an applications upgrade came out on time this spring and by pushing to add decision-support capabilities to it at the eleventh hour.

But sales remain problematic. Although overall service and software sales grew by 25% at the $7.1 billion company last year, application license revenue drooped 1% in Oracle's fourth fiscal quarter, prompting an executive reshuffling last week that separated management of application and database sales.

And Oracle is mulling the idea of making even sharper splits between the two businesses, said President Ray Lane (see story at right).

For some users who have bought packaged applications, Oracle just can't match the breadth of SAP AG's dominant R/3 software.

"When I think about a good database and financial applications, I think about Oracle," said Sam Cox, CIO at Brother Industries Ltd.'s U.S. unit in Bartlett, Tenn. "But when I think about integrated applications, I think about SAP."

Brother, which makes printers, sewing machines and other products, chose R/3 over Oracle's applications two years ago and still rebuffs Oracle's regular attempts to reverse the decision, Cox said.

Users "want a No. 2 alternative to SAP at the high end, and Oracle just isn't it," said Bruce Richardson, an analyst at AMR Research, Inc. in Boston. Shoddy sales work, political infighting and database biases have hamstrung Oracle's applications during "the best manufacturing software market in the history of bits and bytes," he added.

Some installed-base users aren't too spooked by Oracle's sluggish application sales. "Oracle has admitted that it hasn't had its sales act together," said Mary Fonder, CIO at Leeson Electric Corp. in Grafton, Wis. But Oracle is "ahead of the game in being Internet-capable" with its applications, she added.

Leeson, which makes industrial electric motors, is one of about 15 companies that have gone live with network computing applications Oracle released in January. The three-tier technology is easier to support and provides faster responses than Oracle's fat-client software, Fonder said.

Richardson said getting more users to take the network computing plunge is another challenge for Oracle, which is selling only Release 11 of its applications in thin-client mode.

Honeywell, Inc.'s advanced development center in Minneapolis is mulling a quick upgrade to the network computing software but may wait until next year due to product maturity concerns and limited resources. "I'd rather be a little bit careful on this one," said Sig Lygre, IT leader of the company's Oracle implementation team.

Tony Reed, director of information systems at United Advertising Publications, Inc. in Dallas, just upgraded his fat-client Oracle applications and doesn't plan to go to network computing for a year or more.

But Reed said he likes the three-tier concept and said Oracle's salespeople have become more attentive in recent months. "I get more frequent calls now, and they ask more questions about what we're doing functionally," he said. □

Two divisions may be better than one company

Oracle President Ray Lane said the company's application woes are "largely a sales issue." The Redwood Shores, Calif., firm hasn't done a good job of marketing new features such as flow manufacturing, he said, and most of its sales managers cut their teeth on databases, not applications.

Oracle's Ray Lane

Last week's sales changes could just be a first step: CEO Larry Ellison and other top executives are looking at "whether the endgame is two Oracles," Lane said. "More and more, I think we've got to have a database company and an applications company, rather than trying to run a combined business all the way down, at least on the sales side."

Lane said Oracle needs to boost its marketing to compete with enterprise resource planning rivals such as SAP AG and PeopleSoft, Inc. on technology. Marketing is a weak spot, however. "We're reaching the stage in the [enterprise resource planning] game where selling and marketing are critical."

— Craig Stedman and Stewart Deck

Norfolk Southern readies freight system for Conrail branch

▸ *Company upgrades tested system for railroad expansion*

By Patrick Dryden

A BIG CLIENT/SERVER project that revolutionized freight operations at Norfolk Southern Railway Co. is chugging into its second phase: meeting business demands for high availability and supporting an upcoming acquisition.

The Strategic Intermodal Management System (SIMS) replaced tedious, error-prone paper shuffling processes for coordinating intermodal traffic — the movement of truck trailers and shipping containers by train.

For example, the average time required to check trucks at terminal gates plunged from five minutes to one after employees traded clipboards for wireless handheld terminals linked to central Sybase, Inc. databases.

"We got rid of the angry drivers blocking the gates, the delivery delays and the errors that caused lost containers, free storage and congestion in our yards," said Lee Durham, manager of information systems development at Norfolk Southern in Norfolk, Va.

The challenge was "to drastically boost how we used our assets so we could compete not just with other railroads, but with long-haul truck companies," said Hugh Starling, manager of client/server systems.

Improvements through SIMS helped the intermodal unit become the fastest-growing part of the business and contributed to record revenue, officials said.

The project also earned recognition as a finalist in the recent *Computerworld* Smithsonian Awards program and in Platinum Technology, Inc.'s competition this week at the annual user group conference.

Now the Norfolk Southern IS group is finishing the rollout of SIMS to the smallest railyards at the same time it is upgrading components. And the completed SIMS must be ready by Sept. 1 to bear the added transaction load when Norfolk Southern takes over more than half of Conrail, Inc.

A client/server freight management system is critical to Norfolk Southern Railway's fastest-growing business segment

Migrating all clients to Microsoft Corp. Windows NT 4.0 as a standard platform is 95% complete, said Richard Tritt, assistant vice president for systems development at the railroad.

The multimillion-dollar project took three years, if you subtract one year of "false starts" while the staff learned to deal with client/server complexities, Tritt said. But the payoff this year has been dramatic. Managing intermodal freight has gone from "totally inadequate" to "deadly accurate," he said.

For example, the division manager of the Kansas City, Mo., and St. Louis terminals said SIMS enabled his team to increase daily traffic from 57,100 to 79,000 units, with no more than 15 minutes per day spent notifying customers about shipment status.

Now the intermodal department estimates it could lose $50,000 per hour without access to SIMS.

That's why IS managers closely watch servers, databases and networks with various monitoring tools from Platinum Technology.

Besides striving to assure availability of SIMS with early warnings and automated responses, "we're constantly reviewing SQL processes to find bottlenecks and tune to remove the fluff," Durham said.

Other upgrades are aimed at preparing SIMS to take on more transactions from the Conrail acquisition. These include adding processors, memory and disk space for servers supporting SIMS applications, and careful capacity planning for joining the two railroads' TCP/IP networks. □

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SSA refocus kills most Unix development

By Craig Stedman

LEAKY APPLICATION VENDOR SSA is sending out an SOS — and throwing software projects overboard to lighten its load.

Trying to end its money-losing ways, Chicago-based System Software Associates, Inc. (SSA) last week halted development of its applications for all Unix systems except Hewlett-Packard Co.'s.

Instead, SSA is refocusing on its core AS/400 business and on a Windows NT release due out next summer.

The company also is delaying work on promised object-oriented versions of its flagship manufacturing software and other applications.

And SSA's development staff was one of the departments hit hardest by a 300-worker layoff announced last week.

SSA is still the seventh-largest applications vendor, with $299 million in license and maintenance revenue last year, according to International Data Corp. in Framingham, Mass. But it slipped badly in trying to move into the Unix market and has admittedly lost users along the way.

For example, Leeson Electric Corp. switched its four manufacturing plants from SSA's green-screen software to Oracle Corp. applications two years ago. At the time, SSA's client/server software "was a demo," said Mary Fonder, chief information officer at Leeson, a maker of electric motors in Grafton, Wis.

SSA's HARD TIMES

Poor financial results at SSA ...

- $10.7 million loss in first half of fiscal year
- Anemic revenue growth of 6%

... forced these restructuring moves

- Cut 12% of its workforce, affecting 300 employees
- Stopped development on all but one Unix platform
- Shelved its object technology projects
- Cut 25% in office space

And Oracle had less trouble catching up on functionality than SSA did in altering its software to support Unix and client/server, Fonder added.

Even now, SSA executives concede that the Unix version of their Business Process Control System software doesn't scale well. An upgrade aimed at fixing that is being beta-tested now and is due out in September on HP servers.

But SSA is dropping plans to ship the upgrade on previously supported Unix systems from IBM and the former Digital Equipment Corp. A promise to add support for Sun Microsystems, Inc.'s Unix boxes also was scrapped.

Fort Wayne Plastics, Inc. was an early adopter of SSA's Unix software and is sticking with it, even though the applications run on an IBM server.

Mike Durant, director of information services at the maker of plastic panels in Fort Wayne, Ind., said the company hasn't felt the scaling problems and should be able to get by with SSA's current functionality for several years.

But Durant went live with the software a year later than planned because of delays at SSA, and the rollout was halted in midstream after SSA dropped support for character-based Unix terminals.

"They were a little too rosy-glassed in saying what they could do on Unix, and this is the fallout from that," he said.

SSA's restructuring and an April management shake-up were both long overdue, said Joshua Greenbaum, an analyst at Hurwitz Group, Inc. in Framingham. But for Unix and Windows NT applications, SSA is "literally in last place," he said. "They just don't have products." □

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FRANKLY SPEAKING

Dump the export controls

FRANK HAYES

LET'S FINALLY, once and for all, get rid of the cockamamy idea that we can control encryption technology.

Twenty years ago, maybe that notion made sense. Encryption was something of a black art, used only by spies and banks. When the U.S. government's official code-breaking bureau, the National Security Agency, wanted to limit the then-new Data Encryption Standard (DES) with relatively short key lengths and export restrictions, no one complained too loudly.

But today, that's crazy. Encryption is used by nearly everyone — it's the linchpin of Internet commerce. If you want to do business on the Web, you need to be able to keep credit-card numbers and customer information from prying eyes as well as authenticate messages from business partners.

All those things require encryption technology, preferably the strongest possible. And the global nature of electronic business means that strong encryption needs to be available to all your factories, branches and business partners, no matter where in the world they are.

That all seems straightforward. So why are government agencies still making it so hard for most businesses to use strong encryption for global electronic commerce?

Efforts to weaken encryption are crippling American companies.

Case in point: Last week, the U.S. Department of Commerce said it will loosen restrictions so financial institutions can buy software that incorporates heavy-duty encryption for use in their foreign operations.

The Commerce Department says banks get this sweet deal because of their record of cooperating with law enforcement agencies. But they only get to use the strong encryption in 45 countries that have anti-money-laundering laws.

That sounds pretty good — a fine balance between business needs and the responsibilities of law enforcement. Unless, of course, you realize what a sham it is. The U.S. isn't the only country that makes powerful encryption software. Drug lords in Colombia and Mexico can use cryptography to hide their dirty deals — they just can't use cryptography in legally exported products from Microsoft, Lotus and Novell.

Meanwhile, legitimate businesses must use pathetically weak encryption to send business information between their American and international offices and factories. Their business information is put in jeopardy because they're obeying federal regulations against exporting full-strength cryptography technology outside the U.S.

That's nuts. These efforts to weaken encryption are crippling U.S. companies and casting a pall over electronic commerce. They're not hurting spies or smugglers or drug dealers. Worst of all, they encourage politicians and bureaucrats to indulge in the lie that this crippled cryptography is still good enough to protect business information.

Baloney. Thanks to evermore powerful computers and better code-cracking techniques, breaking weak encryption just keeps getting easier.

Last year, encryption vendor RSA Data Security launched a contest to see if anyone could decode a message encrypted using DES. The winner took almost five months to decrypt it. In January, RSA sponsored a similar puzzle. This time the message was revealed in just under six weeks. And this Monday, RSA will start yet another contest. My guess is that the code will be broken in a matter of days. The time after that, it could be hours. No business can afford that kind of risk. And no government should be exposing its citizens to it.

We can't decide who will have strong encryption. We can't control who can break bad encryption. Let's stop pretending, dump the export controls and give electronic commerce the strong encryption it needs. □

Hayes is Computerworld's staff columnist. His Internet address is frank_hayes@cw.com.

SHORTS

H-1B visa bill stalled

Congressional leaders are continuing efforts to come together on a bill that would increase the number of H-1B visas issued each year to highly skilled foreign workers, including information systems professionals. Lawmakers are expected to resume meetings after a recess this week. In May, the Senate passed a bill that would raise the number of H-1B visas issued annually from 65,000 to 105,000 over the next five years. A similar House bill ups the number of visas to more than 100,000 but requires companies to prove that they didn't lay off U.S. workers to hire foreign ones.

Java battle drags on

Like the old song, Sun Microsystems, Inc. says Java rival Microsoft Corp. has taken one step forward and two steps back. The two companies, pitted in a legal battle over the Java language and the technicalities of a licensing contract, are headed for a hearing, which last week was rescheduled to Sept. 4. Sun most recently has alleged that it has found two additional incompatibilities in Microsoft's Java implementation, while noting that Microsoft has taken out some allegedly mislabeled class libraries that were part of the original lawsuit.

AMD posts $65M loss

Advanced Micro Devices, Inc. last week reported a much worse than expected second-quarter net loss of $64.6 million on sales of $526.5 million. For the same period last year, AMD reported a profit of $9.96 million on $594.6 million in sales. The chip maker blamed the results on weakening demand in the worldwide semiconductor industry, coupled with continued price pressures on flash memory products.

Course materials kicked off Web

Law professor Peter Junger said he will appeal a U.S. District Court's ruling that government restrictions on encryption technology haven't violated his rights to freedom of speech. Junger, a law professor at Case Western Reserve University in Cleveland, sued the U.S. Commerce Department over regulations that barred him from publishing encryption-related materials and articles on the Internet for a course, Computing and the Law. Federal District Court Judge James Gwin said computer programs aren't writing, which would be protected by the First Amendment, but "functional rather than expressive."

Microsoft readies NT beta No. 2

Corporate developers will be able to get their hands on the most recent update to Windows NT 5.0 code — a work in progress — at the Professional Developers Conference this fall. After a recent postponement, Microsoft is slated to release Beta 2 of the long-anticipated NT 5.0 this summer. But developers at the conference in Denver this October will get an even more updated code download.

SAP results sing

SAP AG last week said pretax profits for the first two quarters of fiscal 1998 rose approximately 40% over the same period in the previous year. A 40% rise from last year's half-year profits of $337 million would put this year's six-month profits at approximately $471.6 million. SAP's revenue rose about 60% in the first half compared with the same period a year ago, when the software vendor showed revenue of $1.4 billion. Full results are expected July 20.

Lucent buying spree continues

Lucent Technologies in Murray Hill, N.J., last week continued its push into data networking by announcing plans to buy Tel Aviv-based Lannet, which makes Ethernet and Asynchronous Transfer Mode switches for LANs, for $117 million. It will be Lucent's fourth data networking company takeover since September.

CEO lays himself off

Curt Hessler, president and CEO of PC utilities maker Quarterdeck Corp., has taken an unusual step: He has laid himself off. The Los Angeles-based company said in a statement that Hessler, who was hired by Quarterdeck in January 1997, was quitting "both to further the cost reduction program he initiated last month" and to "devote more time to corporate projects as an adviser to the company and the board." Quarterdeck said King R. Lee, a board member, will serve as interim president.

CONTRACT OF THE WEEK

Customer: Sindacato Nazionale Agenzie Ippiche (SNAI), Italy's government-approved bookmaker for sports betting
Prime contractors: Telecom Italia and Datapoint Corp. in San Antonio
Terms: $1.3 million
Highlights: Datapoint will develop a call center, using Nortel, Inc. equipment, enabling SNAI to prepare for Italy's legalization of sports betting by phone. SNAI operates more than 320 horse race wagering agencies and has been named the official bookmaker for soccer, basketball, volleyball, cycling and several other sports.

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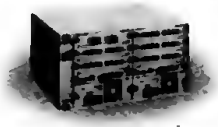

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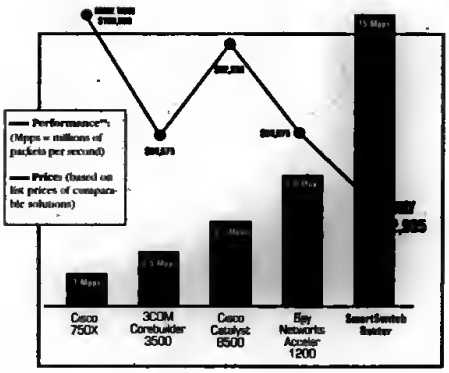
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WINDOWS 98 ROULETTE NOTEBOOK UPGRADE STATUS

Vendor	Dell	Hewlett-Packard	Toshiba
URL	www.dell.com	www.hp.com	www.toshiba.com
Upgradeable	Latitude CP (July 17); Latitude XPi (Sept. 15); Latitude CPi P100 and P133 (needs BIOS upgrade); Latitude LM (certain PC Card network cards may not function properly).	OmniBook 2100, 3100, 4100 and 7100 are shipping with upgrade coupons for $34.95 per user; upgrades with BIOS update included begin mid-August; new touchpad drivers needed for 4100 and 7100.	Satellite Pro, Portege and Tecra customers should wait until the BIOS update is available in early August. Upgrades available for Satellite 305, 315, 325, 335 series; Satellite Pro 470, 480, 490; Tecra 550 and 780; Portege 320.
Not upgradeable	For Latitude CPi P120, P90 and P75 and for Latitude LX 4xxD/T, XP 4xx and XP 4xxD/T, Dell won't provide driver updates if the system is more than 18 months out of production. Latitude 4xx is not upgradeable.	OmniBook Sojourn and two older models, the OmniBook 800 and 3000.	Information unavailable.

Win 98 formula: Test, update, deploy

By April Jacobs

ASSUMING THAT PC makers are ready for Windows 98 could be a big mistake. Compatibility with Windows 95 is no guarantee that a device will work with Windows 98, as some initial adopters have discovered.

Still, the first corporate users testing the new operating system indicate that the upgrade usually provides a straightforward migratino from Windows 95. The key is to test and update before deploying.

Kalman Shor, assistant director of MIS at Michael Anthony Jewelers in Mount Vernon, N.Y., said he is running Windows 98 on about 10% of his PCs without problem. "We find Windows 98 is cleaner than Windows 95," Shor said.

But Windows 3.1 users will likely run into problems. For example, they may find they have to update their system BIOS and peripheral drivers. To be safe, users should start with a clean slate, which means backing up their system files, loading the new operating system and reinstalling applications.

Microsoft Corp.'s long-held stance is that corporate users should migrate to Windows NT, not Windows 98, unless they need access to 16-bit applications, as many Windows 3.1-based users do.

PROBLEMS ABOUND

But even Windows 95 users may have to navigate some hardware issues. Top system vendors such as Compaq Computer Corp., Dell Computer Corp., Gateway, Hewlett-Packard Co., IBM and Toshiba America Information Systems, Inc. are all reporting problems based on BIOS and driver conflicts (see chart). Users in most cases will need to visit their vendor's World Wide Web site to download patches and upgrades for existing systems.

Notebook systems appear to be particularly vulnerable because their components tend to be customized more often than desktops.

Similarly, some widely used peripherals are showing incompatibilities. Because most of those devices work under Windows 95, they could be missed in superficial testing. Such peripherals include the following:

- Modems and PC Card devices.
- Removable storage.
- Printers.
- Universal Serial Bus (USB) devices.
- The system BIOS.

Most vendors are posting Windows 98 patches and advice on their Web pages.

Analysts said users with older PCs and peripherals will have the biggest problems, adding that in many cases vendors have no plans to provide fixes.

Analysts and equipment makers acknowledged the incompatibilities but said they aren't out of the ordinary. And they said the problems with older hardware are to be expected. But analysts agreed that hardware makers in some cases could have been ready sooner with fixes for newer systems — those made in the past six months.

For example, Gateway plans to issue a CD-ROM with all Windows 98 upgrades it sells to help users update their Gateway PCs with proper drivers before making the change. That should eliminate most upgrade problems.

"Make sure your vendors have updates to drivers and BIOS upgrades, because you may have hardware vendors pointing their fingers at Microsoft. But the bottom line is that users can't rely on Microsoft or the vendors to do their work for them," said Michael Gartenberg, an analyst at Gartner Group, Inc. in Stamford, Conn.

For its part, Microsoft maintsins there aren't aoy major bugs in Windows 98 — and it advises users to pay attention to the upgrade directions. Those include disabling some utilities before upgrading a system.

Paul Merenbloom, a senior technology analyst at Prudential Securities, Inc. in New York, said fewer problems are expected with this upgrade than with earlier ones, but users should ask why they even want to upgrade, considering problems with USB functionality, BIOS updates and other issues. □

Senior editor Sharon Gaudin and senior writer Kim Girard contributed to this report.

Fibre Channel remains untapped

By Jaikumar Vijayan

A LOT CLOSER. But not quite there yet.

Nearly five years after vendors began pitching Fibre Channel architectures, the technology remains the "next big thing" in enterprise storage.

Fibre Channel is an interface technology that connects servers and storage systems. With a data transfer rate of 1G bit/sec., Fibre Channel is five times faster than SCSI technologies. Fibre Channel lets users attach servers and storage systems directly across 10 kilometers vs. SCSI's 25-meter limitation.

Implementations are growing steadily (though not as fast as expected), while costs are coming down and more vendors are supporting the technology.

Just last week, for instance, Storage Technology Corp. introduced its StorageNet family of Fibre Channel products aimed at letting users build high-performance dedicated storage networks.

And EMC Corp. recently started to ship a Fibre Channel network bub that lets companies do the same. The vendors are among several companies that support Fibre Channel, including IBM, Sun Microsystems, Inc., Compaq Computer Corp. and Data General Corp.

But concerns about interoperability and product maturity mean that Fibre Channel won't start to move into the mainstream for at least another two years, users and analysts said. At just more than $200 million, revenue from Fibre Channel sales last year was less than half the $450 million predicted by International Data Corp. (IDC), a consultancy in Framingham, Mass.

And a soon-to-be-released IDC report pegs Fibre Channel revenue at $6 billion to $8 billion in 2001 — lower than the $8.85 billion predicted earlier.

"As a concept, [Fibre Channel] is great. But getting there is going to be another story," said Kevin Trapp, a storage analyst at GenAmercia Corp., an insurance company in St. Louis. "Almost everybody I know sees a need for it. But almost no one has started actually implementing Fibre Channel fully yet." That's because users must wait for all the pieces of Fibre Channel to fall into place, said Robert Gray, an analyst at IDC. "What you are seeing is a normal rollout of a complex, new technology," Gray said.

Moving to Fibre Channel means enabling an entire infrastructure that includes storage systems, chips, disks, mechanical components, adapters, device drives and management software — all of which have to work well with one another, he said.

Still, Fibre Channel's high speed and long maximum cable length are crucial at a time when mushrooming corporate dats is forcing administrators to look for faster, more efficient ways to back up and store dats throughout buildings and campuses.

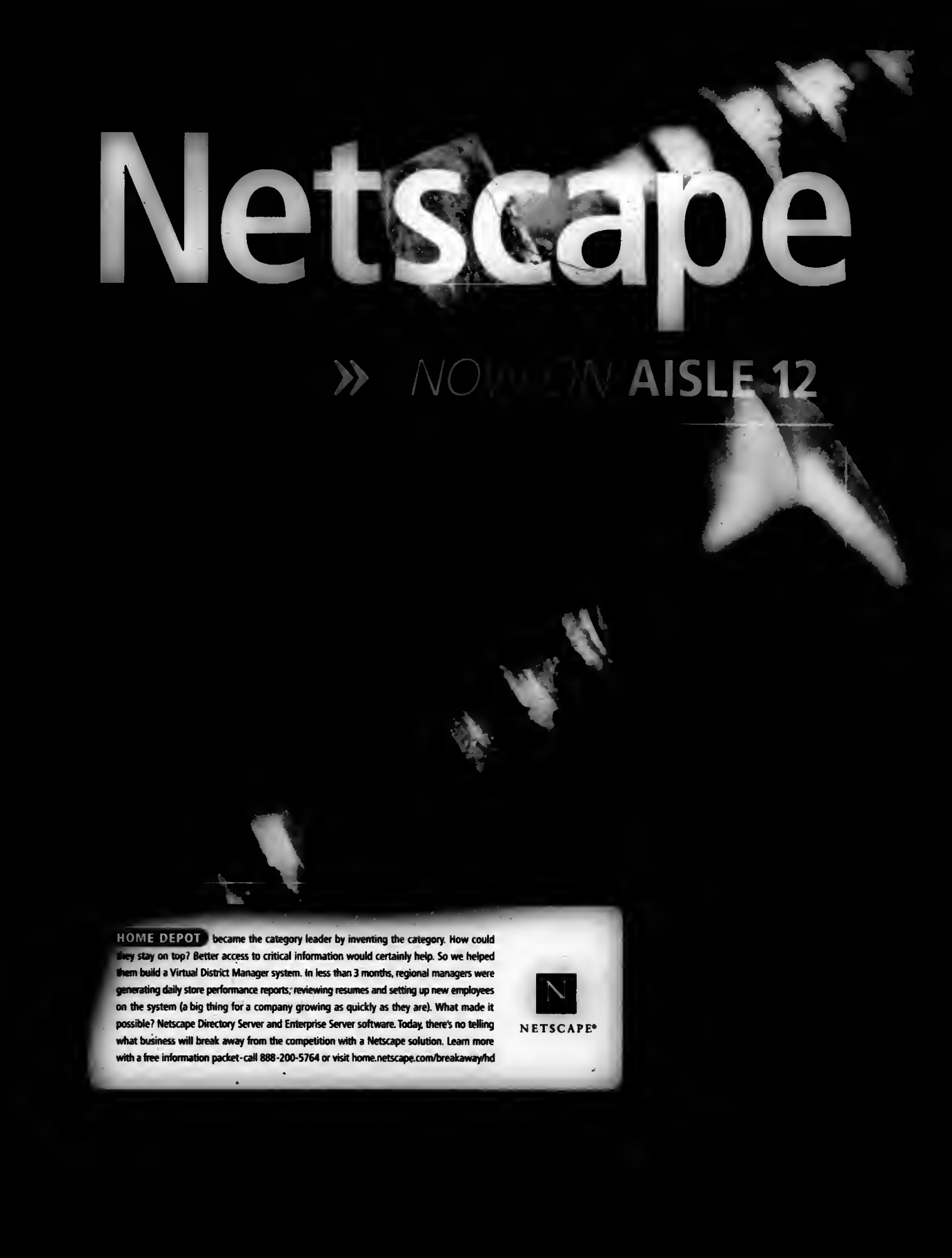
For PP&L, Inc., an Allentown, Pa.-based utility, Fibre Channel holds the promise not only of speedier dats backup, but also of eventually creating storage networks.

The company, which has started to centralize storage of 4T bytes worth of data, recently implemented Fibre Channel links between a few of its largest Unix servers and its enterprise storage systems.

The implementation improved performance but cut by half the number of servers that can be attached to the storage system — a constraint that can be overcome only by implementing unproven switching technology. □

MORE ONLINE

For Fibre Channel resources, visit Computerworld online. www.computerworld.com/more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Future of client-side Java in doubt

▸ *But many industry observers say death reports are exaggerated*

By Carol Sliwa

JAVA IS DEAD on the client.

That has been the oft-heard refrain from Java naysayers for some time, but the critics recently found an unexpected ally in one of Java's early cheerleaders, Netscape Communications Corp. co-founder Marc Andreessen.

Java on the client doesn't work, he said at the recent Enterprise Outlook conference in Burlingame, Calif., pronouncing his company's efforts to write a Java browser "dead."

But plenty of corporate users and industry analysts aren't ready to sound the death knell for client-side Java. They said client-side Java can provide user interface and processing advantages for interactive 'net-based applications — although some readily acknowledged that browser-based Java may not always be the best option, given its uneven level of support in the two major browsers from Netscape and Microsoft Corp. (see story, page 6).

Daiwa Securities America uses Java in two trading systems applications that are accessible via Internet, intranet and extranet.

The New York-based company doesn't run the applications through a Web browser because the browser's Java virtual machine (JVM), which compiles the Java code, is inadequate.

Instead, developers wrote a downloadable Java client that runs outside the browser, said Jeffry Borror, Daiwa's director of information technology.

KEEP IT SIMPLE

Ralston Purina Co. in St. Louis wrote one version of its Java application for a browser and another for an independent client. "We have configurations where it's desirable to do both," said Mary Patterson, director of manufacturing execution systems at Ralston Purina's pet products division.

For the browser-based application, Patterson acknowledged that the company had to write "code to the lowest common denominator [of Java] that's standardly available."

"One general rule of thumb is to try to stay at a level that is commonly supported across at least Sun [Microsystems, Inc.'s] JVM and not get out at the fringes too far," she said.

Developers do have alternatives to client-side Java for their World Wide Web-based applications. They can write the browser-based clients using Hypertext Markup Language (HTML), scripting languages, dynamic HTML or Extensible Markup Language (XML).

Developers at Daiwa Securities wrote a downloadable Java client that runs outside the browser, Jeffry Borror said, because browser clients are "inadequate"

MAKE OR BREAK

But those options aren't always viable. "There are certain applications where the use of [client-side] Java can make or break the cost-effectiveness of the application," said Tim Sloane, an analyst at Aberdeen Group, Inc. in Boston.

A complex application — such as a financial company's portfolio analysis package — that needs heavy graphical and number-crunching capabilities and may have to take thousands of simultaneous hits is a good case in point, he said.

If the application does most of the processing on the server, "I'm going to need one hell of a server farm," Sloane said. "You're better off spinning it to the desktop."

Java on the client has been eclipsed by Java on the server, said David Smith, an analyst at Stamford, Conn.-based Gartner Group, Inc.

But he maintained there is a place for client-side Java "if you want to do any kind of real logic on the client."

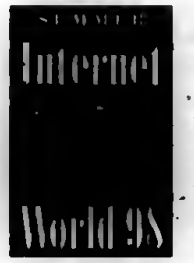
Despite the debate, both client and server Java seem secure. A study of 24 Fortune 1,000 companies that write Java applications showed that 83% use Java for the client and 79% use it for the server. In two years, all of those companies predicted that they would use Java on the server, and 88% expect to use Java on the client, according to the report done by Forrester Research, Inc. in Cambridge, Mass. □

• Lotus, Sun team up

ESuite set for the 'net

By Roberta Fusaro and Carol Sliwa

THIS WEEK at Internet World Summer '98 in Chicago, Lotus Development Corp. and Sun Microsystems, Inc. will roll out Lotus' ESuite Workplace 1.0 for Sun's JavaStation network computer.



The package will let organizations add more functionality to the network computer, such as browsing, E-mail and word processing capabilities. Until now, JavaStation terminals more often have run "dedicated function" applications, such as those used in airline kiosks or hotel reservations systems. The JavaStation will run Sun's Netra J software.

Lotus demonstrated the ESuite desktop package — which includes E-mail, word processing, spreadsheet and calendaring applications — on a JavaStation when the product was launched last November.

ESuite Workplace will be available July 21. Current JavaStation users will be offered a free 120-day trial of the product. They can then purchase it for $49 per seat. The list price is $79.

Also on tap this week at Internet World are the following:

■ **IBM** plans to introduce several electronic-commerce business partners in the areas of merchandising, software distribution, customer service and enterprise resource planning.

■ **FirstPlace Software, Inc.** in Joplin, Mo., will announce Web-Position Gold, software designed to help companies optimize their World Wide Web pages to achieve top positions in search engine result lists. FirstPlace and **Response Direct, Inc.** in Weston, Mass., also will unveil the results of a Fortune 100 Internet search engine-ranking study that details which firms fared best in company name and relevant keyword searches. Preliminary findings showed that Amoco Corp. and Wal-Mart Stores, Inc. had top visibility, according to Fredrick Marckini, president of Response Direct.

■ San Diego-based **Chrystal Software**, a Xerox Corp. subsidiary, will introduce two applications for technical publishing groups. Web Services offers users remote access to and the ability to navigate through documents in a corporate repository. Advisor lets document reviewers enter comments and edits online while they review others' remarks. □

Survey: World is ready for 2000

By Matt Hamblen

CONTRARY TO THE USUAL gloomy reports, a study by investment analysts at Merrill Lynch & Co. found that only three of 3,800 companies worldwide are deemed unlikely to have systems ready for the year 2000.

More than 95% of the publicly traded companies in the survey released last week are listed as "will be compliant" or "likely" to be ready.

But 157 are listed in the category of "don't know" because they didn't respond to the survey or the information wasn't conclusive. Another 10 companies were listed as "less likely" to meet the deadline.

"In general, companies appear reasonably confident of their own Y2K issues but uncertain about those same issues at their suppliers and customers," said Jeaone Terrile, first vice president at Merrill Lynch in New York.

"Few companies expect earnings to be noticeably impacted by Y2K expenses, although the cost of compliance is reported to be much higher in the U.S. than elsewhere," she said in a statement.

TWO U.S. COMPANIES CITED

In the 440-page study, "Y2K: Implications for Investors," none of the U.S.-based companies were listed as unlikely to be ready. But the report does cite two U.S. companies in the "less likely" category: The Sabre Group in Fort Worth, Texas, and Sequent Computer Systems, Inc. in Beaverton, Ore.

Sabre announced an earnings shortfall because of higher-than-expected year 2000 spending, the report said.

In response, a Sabre spokeswoman said the rating was "surprising" considering that the company has 95% of its internal systems certified as ready and is now shipping compliant software to 40,000 travel agents. The company will be ready in time, she said.

The study also said Sequent expects to have less than 90% of its systems — internal systems and the products it sells — compliant in time.

But a Sequent spokesman said the company "is very positive" it will be ready internally by year's end and is already selling compliant servers to customers. □

U.S. firms sweat foreign telco Y2K readiness

By Matt Hamblen
NEW YORK

U.S.-BASED multinational companies worry they will spend a bundle to get year 2000-ready at home, only to find that network carriers they use abroad are unprepared and well beyond their control.

At a field hearing of the U.S. Senate Special Committee on the Year 2000 Technology Problem last week, federal officials expressed doubts about international readiness, which could be a big problem for banks, brokerages and manufacturers that rely on foreign carriers.

"It's fine if the U.S. networks are ready, but so what? We're concerned about operations in Europe and Asia," said Peter A. Miller, chief information officer at J. P. Morgan & Co. in New York, after testifying at the hearing.

CINDY KUNKE

J. P. Morgan CIO Peter A. Miller: "It's fine if the U.S. networks are ready, but so what?"

Morgan expects to spend $250 million in preparing its systems for the year 2000, Miller said.

"I don't know how you can coerce these [foreign carriers] into fixing the problem," said Bill Coopman, manager of telecommunications, industry and regulatory affairs at tractor maker Deere & Co. in Moline, Ill. "Our networks may not be as critical as a bank's, but we have 60 factories globally with systems that depend on suppliers connected by [electronic data interchange], and those factories cannot be down too long."

Corporations are urging government and international bodies, including the Federal Communications Commission and the International Telecommunication Union (ITU) in Geneva, to pressure carriers to fix and test their networks.

For example, Deere and other multinationals in the Brussels-based International Telecommunications User Group are lobbying the ITU for more action, but progress seems negligible.

Users and analysts worry about network interoperability because network switches, embedded chips and billing systems could be date-sensitive and fail.

A study by Merrill Lynch & Co. in New York found that 29 voice and data carriers in the U.S. are likely to be ready for the century date change, but half the carriers in Latin America are in the "don't know" category. For example, Brazil's Telebras was listed as "woefully uncompliant at this stage."

Similarly, a study by British Telecommunications PLC showed that only 11% of its interconnect partners in Africa and the Middle East were working toward compliance, compared with 49% in the Americas.

"Given the sheer number of organizations that are potentially at risk, it is inevitable that Y2K-related disruptions will occur," said Ernest Patrikis, first vice president of the Federal Reserve Bank of New York, at the Senate hearing.

Patrikis bemoaned the lack of reliable, public information on international readiness, a situation made worse because companies are worried about legal liability. □

& Users say Bellcore's plan to handle year 2000 testing for a group of carriers isn't good enough. Page 35

TAXI

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Expanding Possibilities

AS/400 keeps chugging

CONTINUED FROM PAGE 1

IBM launched the workhorse of midrange servers in 1988, and today the AS/400 is alive and kicking, with an installed base of 500,000 servers, 15% revenue growth in the first quarter compared with a year earlier, a 24% increase in first-quarter North American sales and 60,000 systems sold each year, according to IBM.

Serious concerns still abound about the platform's proprietary image and what is perceived by longtime users as IBM's failure to aggressively promote the platform (see story at right). But the numbers fly in the face of long-standing predictions about the demise of the platform, first from the spread of Unix servers in the early 1990s and more recently from Windows NT. The AS/400 "is still a very hot box," said Steve Tirone, an analyst at AMR Research, Inc. in Boston.

Bergen CIO Linda Burkett: "We had no idea IBM would perpetuate" the AS/400 so well

OLD RELIABLE

Some of the reasons behind the continuing popularity of the AS/400 are its reliability, ease of use and low cost of management. The AS/400 continues to be an out-of-the-box product with bundled applications, communications software and its own database, said Michael Crump, a technical project leader at Ball-Foster Glass Container Co. in Muncie, Ind.

But a lot of the AS/400's success also comes from its history of being able to integrate new technologies with very little disruption to business operations, users and observers said.

For instance, J&L Fiber Service, a Waukesha, Wis., materials supplier for the paper industry replaced its old AS/400 system with a high-end 64-bit system. Despite the magnitude of the shift — resulting in a tenfold performance increase — no changes were required to the application code or logic, said Pete Hall, a programmer at the company.

"The conversion to 64-bit was as simple as restoring the objects on the new system," said Hall, who has worked on AS/400s for a decade.

IBM launched the AS/400 to replace its System/38 (see story below). Over the years, IBM has kept many of the original features but adapted the overall system.

"IBM is doing a lot to break the image that the AS/400 has of being old technology," said Steadman, manager of midrange services at Cornerstone Retail Solutions in Austin, Texas. Cornerstone runs a tracking application on the AS/400 and is looking to move its Lotus Notes server off a Windows NT box to the new Model 170. Cornerstone also plans to host the company's World Wide Web site on the AS/400.

IBM also has succeeded in making the platform far more open than ever. For instance, the AS/400 today offers native support for mail and messaging technologies such as Lotus Development Corp.'s Domino and enterprise resource packages from companies such as SAP AG, PeopleSoft, Inc. and The Baan Co. A PC-on-a-card option lets users run and manage Unix and Windows NT applications on an AS/400.

"If you need it, you can even get an AS/400 the size of a mainframe today," said Linda Burkett, chief information officer at Bergen Brunswig Corp., a pharmaceutical distributor in Orange, Calif.

"When we went in for the platform, we had no idea that IBM would perpetuate the line as well as they have," said Burkett, a 10-year AS/400 veteran.

The system's proprietary legacy was a concern but didn't stop Saab Cars USA, Inc. from installing a large AS/400-based intranet application linking its Norcross, Ga., headquarters to dealers nationwide.

The Lotus Domino application was tested on a Windows NT server environment before it was installed on the AS/400 because it was a far more suitable box in terms of scalability, said Jerry Rode, Saab's director of information systems. □

& Saab uses Web, AS/400 and mainframe to link 225 dealers. Page 41

AS/400: THEN AND NOW

	1988	Now
High-end model	AS/400 9406 Model B60	AS/400E 1998 Model S40
Processors	Up to two; 48-bit CISC	Up to 12; 64-bit RISC
Maximum memory	Up to 96M bytes	Up to 20G bytes
Maximum storage	Up to 27.3G bytes	Up to 1.5T bytes
Comments	Launched as a System/38 replacement and System/36 upgrade	Positioned as a server for Web, data warehouse and enterprise resource planning applications

The ubiquitous, invisible server

IBM launched the AS/400 in June 1988 to replace the company's 10-year-old System/38 line and provide an upgrade path for users of System/36 systems (see chart). It was also a calculated volley in what was then a minicomputer battle with Digital Equipment Corp.'s VAX line.

In pitching the new AS/400, IBM emphasized its ease of use, low maintenance and greater connectivity — features that found appeal among users struggling since the 1960s with more complex mainframe architectures.

Over the years, the company has moved to 64-bit RISC chips, has drastically improved storage and memory, and has shifted from System Application Architecture communication protocols to TCP/IP.

Dean Asmussen, president of Enterprise Systems Consulting, Inc., an AS/400 consultancy in Pequop Valley, N.C., said the latest AS/400 models support programs compiled a decade ago without change and can even run Java programs.

The AS/400 is "the most ubiquitous system you never heard of," Asmussen said. — Julianne Vijayan

Users to IBM: Focus on marketing

If IBM has earned kudos from users for building a reliable box in the AS/400, those same customers have also slammed the company for allegedly failing to promote the product aggressively.

Users of the platform argue that the box's proprietary past combined with IBM's failure to communicate its present strengths have pushed the AS/400 down the priority list for software vendors and IS managers.

Tom Jurasik, recently appointed general manager of IBM's AS/400 group, acknowledged the concerns and said addressing them was his No. 1 priority.

"The AS/400 is a growth server for IBM. We are planning for it, and we are investing in it appropriately," he said. IBM will spend "several millions of dollars" in a global publicity blitz in September, including new ad campaigns, customer seminars and direct-mail campaigns, Jurasik said. — Julianne Vijayan

Happy IS staff makes happy users

By Thomas Hoffman

A NEW STUDY shows that one of the greatest contributors to end users' dissatisfaction with information systems departments is lack of communication during system upgrades and application rollouts.

The study, conducted by The Concours Group, an IS management consulting firm, was based on a survey of 1,000 IS employees and 4,000 end users at 14 companies.

The best companies tend to set up deployment groups that involve end users across different business functions in order to "get user feedback and communicate changes well," said Eileen Birge, a research director at the Concours Group in Kingwood, Texas.

The companies with the best practices also tend to regularly conduct end-user satisfaction surveys. However, obtaining accurate results can often be tricky. At Staten Island University Hospital in New York, PC/LAN technicians are instructed to leave an information technology services rating form with the end user. The problem was "a lot of ratings forms were conveniently being lost" by technicians who were trashing unflattering reports, said Rick Carney, chief information officer.

Staten Island University Hospital's Rick Carney says "a lot of ratings forms were conveniently being lost"

That is less of an issue now that the hospital is outsourcing most of its PC/LAN services to Compucom Corp., a Houston-based systems integrator. Compucom has hired an independent third-party firm to call back about 5% of end users who filed trouble tickets with Compucom over the past month, Carney said. "We're getting a better response rate now," he said.

The Concours Group study also highlighted an obvious but nevertheless important point: An IS organization with happy IS employees tends to have highly satisfied end-user customers.

The study's biggest surprise was that IS employees report greater job satisfaction if they have a clearly defined IS mission or "vision" from upper management, Birge said.

Compensation and training were deemed "important" by IS employees surveyed, Birge said, but the study found that big pay raises typically yielded only small upticks in employee satisfaction, Birge said. □

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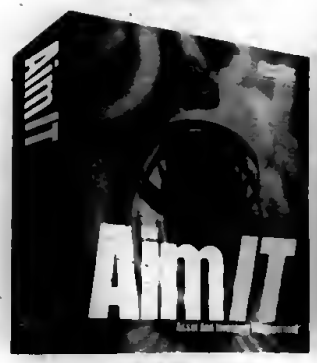

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Voice recognition grows up

CONTINUED FROM PAGE 1

A growing list of companies, including United Parcel Service of America, Inc. and Charles Schwab & Co., are deploying full-scale voice recognition systems to cut costs and improve customer service.

At Sao Francisco-based Schwab, the company's VoiceBroker system lets callers speak in conversational English to get quotes on 13,000 stocks and mutual funds in real time. For example, say "IBM," and you get the IBM stock quote. The system boasts a near 99% accuracy rate and saves the brokerage as much as $2 to $3 each on calls that previously were handled by live operators.

Schwab's VoiceBroker system has a near 99% accuracy rate and saves the brokerage as much as $2 to $3 each on calls previously handled by operators at its call center

Sears was able to boost customer service by replacing thousands of switchboard operators with voice recognition software, which routes customer calls to departments much faster (see story at right).

READY TO GO

"Speech recognition is now ready for prime time because the accuracy level is finally above 90%," said Donna Fluss, an analyst at Stamford, Conn.-based Gartner Group, Inc. "People are still questioning whether 90% is good enough, and my question back is always, 'How accurate are your agents?' "

The return on investment of the technology will take, at most, nine to 18 months, Fluss said. So it isn't surprising that Gartner Group predicts that 30% of new customer service systems will include voice recognition by 2003.

The leading vendors in the voice recognition field include Nuance Communications, Inc. in Menlo Park, Calif.; IBM in Armonk, N.Y.; Lucent Technologies in Murray Hill, N.J.; Dragon Systems, Inc. in Newton, Mass.; Applied Language Technologies, Inc. in Boston; and Voice Control Systems, Inc. in Dallas.

Although the efficiency of voice recognition saves companies money, many users said that is secondary to the real payoff: providing the instant gratification that customers crave. Callers don't have to speak to a human being or navigate a lengthy menu of keypad options. They are never put on hold or forced to listen to canned music and advertising.

"Customers want information about the market immediately. There isn't any way we could staff enough people so there never is a wait during busy hours or a market storm," said Steven Soso, Schwab's director of voice technology.

"People perceive the risk of speech recognition as significantly reduced now," said Bob Morgen, a principal at SRI Consulting, Inc. in Menlo Park, Calif. The cost savings — as proved at Schwab — are also a huge incentive to adopt the technology, he said.

> "People are still questioning whether 90% [accuracy] is good enough, and my question back is always, 'How accurate are your agents?' "
>
> — DONNA FLUSS, GARTNER GROUP

"Speech recognition, if done properly, can offer high-quality customer service at a modest cost," he said. By comparison, "human beings offer modest customer service at high costs."

But speech recognition done properly involves constant system updates and enhancements, which are time-consuming and represent additional costs.

"Our biggest lesson was the cost involved in updating the dictionary and the grammar in companies' names," Soso said. "There are so many mergers and acquisitions, and companies change their stock symbols. If we haven't updated the system's grammar, then we'll give the wrong quote back," he said. So Schwab updates its system twice a month.

How callers identify what they want also varies widely. A customer who wants a quote for IBM, for example, might say "IBM," "International Business Machines" or "Big Blue."

Schwab's initial project team came up with 2 million permutations on how to identify 13,000 stocks and other financial funds. Today, VoiceBroker recognizes them all.

UPS, the Atlanta-based package delivery company, opted for voice recognition because its tracking system includes both numbers and letters — sometimes as many as 18 digits. "We knew it could be cumbersome on a keypad," said Joan Madden, project leader at UPS.

But questions still loom about how well voice recognition systems will handle accents and foreign languages.

"In America, we have Spanish names on the street. Are we comfortable it will understand that? I don't have that comfort level now, but I do believe it will get there," Madden said.

The system handles 120,000 calls per day, and the company's six-figure investment paid for itself within four months, the officials said. The cost is roughly one-third what the company would have had to pay operators to handle the same number of calls, according to a UPS spokeswoman.

"One of the things we've proved is that customers prefer this method of communication because it's timely, predictable and accurate," said Carl Skonberg, project manager at UPS.

On the customer side, UPS currently uses its speech recognition system only for package tracking, but the company is considering expanding it to let customers schedule package pickups. Because of UPS's successful handling of more than 1 million transactions per day with an internal voice recognition system, officials are optimistic the system can work.

Operators now recite an address into a headset, and a one-inch-square, machine-readable label is slapped onto a package, which can then be automatically sorted.

WORLDWIDE RELEVANCE

As companies go global, voice recognition systems have other benefits. For example, they work even in places where Touch-Tone phones aren't prevalent and frequently are the best alternative to human operators (see story at left).

In many countries, including a large part of the U.K., "if they want to do intelligent voice response, they have to do it with speech because there's limited Touch-Tone capability," said SRI Consulting's Morgen.

In the U.K., for example, telephones have numbers but not letters, which makes it impossible for callers to spell out the name of the person they want to reach. □

'Hello, Sears? Let me speak to Maytag'

A voice recognition system Sears installed last March has allowed the retailer to move about 3,000 switchboard operators into other jobs. In 760 of its 830 stores, voice recognition systems have replaced phone operators.

Now, instead of talking to a human being, callers can request a department or even a brand name and have their call routed to the appropriate department.

In addition to department names, such as automotive or shoes, the system recognizes brand names such as Maytag and Nike, said Jan Drummond, a spokeswoman for the retailer based in Hoffman Estates, Ill.

Eventually, the same system might be used to give customers more detailed information, such as whether a particular refrigerator model is in stock and available for immediate delivery, she said.

Voice recognition was a good fit for Sears because 79% of the calls received at its stores are from customers asking to be transferred to a department.

In addition to eliminating the switchboard operators, the application has improved customer service, Drummond said. Whereas a switchboard operator can handle only one call at a time, each incoming phone line on the voice recognition system can field four calls at a time. Shorter waits mean customers are less likely to grow impatient — and call a competitor, Drummond noted.

— Barb Cole-Gomolski

Phoning from a low-tech land

Voice response systems have their benefits, whether you're in the low-tech or the high-tech world.

On a recent visit to the Isle of Skye, off the coast of Scotland, I needed to phone home in the middle of the night. But the antiquated contraption in the lodge where I was staying offered no way to enter my calling-card number.

Armed with AT&T's U.K. toll-free access number, I spoke the number in a normal tone of voice, rattled off my calling-card number after a voice prompt — and the call went through instantly. No extra charges for operator assistance.

Back in the high-tech U.S., tracking a UPS package was easy, too. I simply called the UPS voice response system, spoke the locator digits into the receiver, and four seconds later, the computer read back the letters and numbers for my approval.

When I acknowledged that all was correct, the computer said, "Please hold while your request is being processed. [One second elapses.] Your package was delivered on June 30, 1998, at 9:24 a.m. It was received by the receiver, name spelled G-A-Y. To listen to the information again, please press 1. To track another package, press 2. For all other inquiries, press 0."

— Carol Silva

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Cookies

DEFINITION: Cookies are small amounts of structured data that are shared between a World Wide Web server and a user's browser. Cookies give the server information about a user's identity, preferences or past behavior. Cookies use forms that users are asked to fill out when they get to a Web site that supports them. Not every browser can support cookies.

Cookies are a marketer's dream, but do they watch too closely?

By Sharon Machlis

COOKIES ARE SMALL DATA FILES, typically less than 4K bytes. They are generated by World Wide Web sites to track the number of visitors and to which areas of the site those visitors go. Cookies are accepted by a user's browser for storage on the client's hard drive. At future sessions, the Web server accesses the cookie data, including log-on and password, so users don't have to log in each time they visit. But there's a problem. The site can offer personalized information for target advertising.

Netscape Communications Corp. was the first to use cookies in a browser, and Microsoft Corp. adopted the technique soon thereafter. But not all browsers support cookies, particularly early versions.

Customized data vs. privacy concerns

"It's useful. So far, [cookie technology] meets our needs," says Scott Randall, CEO of Fairmarket, Inc. in Woburn, Mass., an online auction Web site that offers custom data for users who want to monitor certain merchandise and bids. "It's just an easy way to keep track."

However, some consumers worry that the cookies watch too closely.

"The information contained in most cookies is trivial but is still enough to make programmers' and marketers' dreams conceivable and give privacy advocates fits," writes Simon St. Laurent in his recent book, *Cookies*.

Rumors that cookies can rifle around users' hard drives, looking at or destroying files, are unfounded. The U.S. Department of Energy's Computer Incident Advisory Capability team in Livermore, Calif., which tracks viruses and hacking activity, issued a bulletin in March that calls such fears groundless.

But cookies do present security issues. For example, a hacker at a bank could leave a cookie on his own system and try to alter it to simulate data that might be left on another user's machine. He then could use that data to access another user's account.

Newer browsers give users the power to block cookies or to be asked before a cookie is stored on their systems. Some third-party software also helps manage cookies. But it's difficult for users to know why cookies are being placed on their systems and what they contain.

The Internet Engineering Task Force is developing a standard that will incorporate a cookie header with a simple explanation of its purpose and a URL where the user can get more detailed information, says Dave Kristol of Bell Laboratories in Murray Hill, N.J., who is co-author of the task force's proposal. It also will offer more standardization in the way browsers handle cookies. More information is available at Bell Labs' Web site, *http://portal.research.bell-labs.com/~dmk/cookie.html*. □

COOKIE RECIPE

The following are components of a cookie:

Name: What the programmer chooses for the cookie.

Domain: The domain name from the server that created and sent the cookie.

Path: Information about the path of the Web page a user was reading when the cookie was sent. This setting helps restrict other sites or areas within a site from accessing the cookie data.

Expiration date: When the cookie is set to expire, in the format date-month-year-time (24-hour time, Greenwich Mean Time).

Secure: If this value is set in the cookie, the information is encrypted during transmission between the server and the browser.

Value: The specific data being stored for future recognition and action by the Web server; no white space, semicolons or commas can be included, and a 4K-byte limit is desirable.

Source: *Cookies*, by Simon St. Laurent, The McGraw-Hill Cos., New York

WEB SITES:

Starts about Cookies

- Cookie Central, general information about cookies (*www.cookiecentral.com*)
- Cookie Specification, a quick update on the latest work to update the cookie standard (*http://portal.research.bell-labs.com/~dmk/cookie.html*)
- RFC 2109 from the Internet Engineering Task Force, technical details on a proposed new standard for cookies (*http://info.internet.isi.edu/innotes/rfc/files/rfc2109.txt*)
- Information on cookies and privacy from the U.S. Department of Energy's Computer Incident Advisory Capability team (*www.ciac.org/ciac/bulletins/i-034.shtml*)
- Frequently Asked Questions from Netscape Communications Corp. (*http://search.netscape.com/assist/security/faqs/cookies.html*)

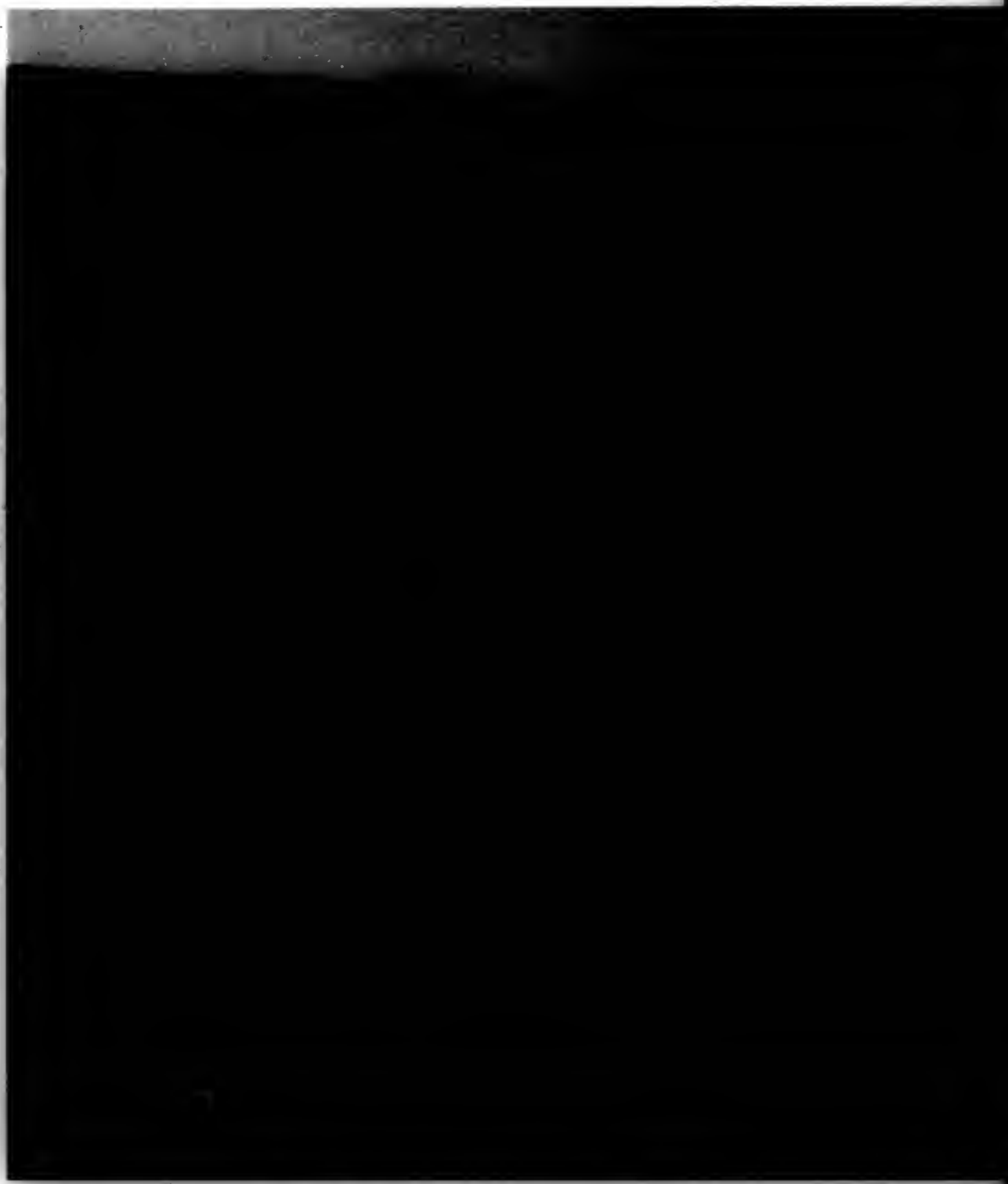
MAILING LIST:

- Hypertext Transfer Protocol Working Group discussion list, for technical information about emerging cookie and related standards. Send E-mail with the subject "subscribe" to *http-wg-request@cuckoo.hpl.hp.com*, or read the list archives at *www.ics.uci.edu/pub/ietf/http/hypermail/*

BOOK:

- *Cookies*, by Simon St. Laurent, The McGraw-Hill Cos., New York, $34.95.

■ *Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to QuickStudy editor Stefanie McCann at stefanie_mccann@cw.com*



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OPINION

Wooing Wall Street

Information technology vendors have a new customer. And it isn't you. It's the stock market. The allure of instant riches in this time of hyperinflated market values has given birth to a new kind of business plan, one in which the customer is curiously absent. In this climate, the customer is not so much the end user as the deep-pocketed telco or software giant that throws stock around.

In fact, I've detected a sort of recipe for high-tech entrepreneurship in the latter '90s, based on my recent experience with start-ups:

Take two to three name developers. Add a few million dollars of venture funding from well-known "angel" investors. Stir in data from a noted market research firm that shows triple-digit percentage growth in your core market. Add a lowercase "e" to your name. Mix well. Fold into a PowerPoint presentation.

Do a road show. Hire an investment banker. Wait for the phone to ring.

If you're lucky, you can get bought for many millions of dollars without going to the trouble of signing up customers or actually releasing a finished product.

Think it's ridiculous? It happens again and again. More money was spent on mergers in the first half of this year than in all of last year, according to Securities Data Co. Consolidation and cheap capital are creating a buyout frenzy. AT&T and TCI reportedly brokered their $48 billion deal in less than three weeks.

While it's nice that Wall Street is minting high-tech millionaires like M&Ms, it's a little troubling that the customer is so incidental to the whole process. Increasingly, the presentations I hear from start-up companies lead with lists of investors, channel partners and enthusiastic analysts. Increasingly, these presentations lack customer references. Why bother? The customer is a minor player in this high-tech pyramid scheme.

If you've made a killing off the high-tech bull market, good for you. But be aware that some of today's start-ups are interested only in staying around long enough to cash out at a big multiple. If it's your own money at stake, that's fine. But be careful of betting your company's money on vendors whose most important customer is someone other than you.

Paul Gillin, *editor*
Internet: *paul_gillin@cw.com*

AT LAST! AFTER YEARS OF SEARCHING AND MILES OF TRAVEL, WE'VE FOUND IT! THE GOLDEN GOOSE!!
FIRST, COULD YOU SIGN THIS FORM LEAVING YOU LIABLE SHOULD ANY HARM BEFALL THE GOOSE —
EVERYONE TURN BACK!!!
Y2K

LETTERS

Detailed metrics needed to gauge IT impact on business

FRANK HAYES' COLUMN "IS' doesn't measure up" [CW, April 13] makes some good points but misses some fundamental issues regarding the measurement of IT performance.

It's true that IS managers should "start by getting out of the IS shop."

But a "1-to-10 satisfaction scale" and "15-minute" interviews with a "few key users" won't get you very far.

What if one of your "key users" is still steamed about yesterday's E-mail crash? The unpleasant truth is that measuring IT value is difficult.

IT directors and business unit managers must work together to develop detailed metrics that accurately gauge the real impact on business processes.

Hayes dismisses existing IT metrics, such as function points and capacity utilization, as "techno-trivia."

But we must still deal with the reality that at least 70% of IT budgets support and maintain infrastructure.

Hayes implies that measurement isn't that important.

Perhaps Olympic runners should use spectator surveys to decide who receives the gold medal.

Alan Gonchar
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You call this improvement?

LET ME SEE if I got this straight. Anheuser-Busch decided to move from Novell NetWare to NT Server [CW, June 8]. They wound up having to triple support staff, and they had to purchase additional network management software besides. In the final analysis, was that perceived as an improvement?

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Force won't solve year 2000

COMPUTERWORLD's June 1 issue seems to be trying to compete with the tabloids, given its Page 1 headline "Year 2000 coders face 'bloodbath,'" and its year 2000 fantasy-scare article on Page 68, "Life during wartime."

But the real scare is on Page 4: "Government action on year 2000 not enough." President Clinton obviously does not know what cyberspace is, but he has recognized that the year 2000 problem is an opportunity to make new laws. *Computerworld* quotes Capers Jones as saying Clinton, Vice President Al Gore and Year 2000 Conversion Council Chairman John A. Koskinen "are not doing enough to . . . force the private sector to get ready."

Force never gets along with freedom very well. Those who think force is the answer are the scary ones. Year 2000 may be a problem, but the attempt to use laws and government force to destroy our freedom to choose and act — for any reason — is the real danger.

Scott Crosby
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Funny year 2000 terms show management's view

I'VE BEEN DIGGING up year 2000 compliance information for a medical facility in Ohio, and the process has not been without its dose of hilarity. I have come across a few interesting terms for the change of century that companies are using in their compliance and product literature. Some of these terms clearly display the management attitude and position of the company. Others are just funny:

- The year 2000 impact. (They're obviously expecting disaster, like a comet hitting the Earth.)
- Year 2000 issues. (Sounds like they expect the year 2000 will cause paramount personal problems.)
- The year 2000 problem. (Speaks for itself.)
- The year 2000 event. (Where do I buy tickets?)
- Year 2000 compatibility. (As if time itself were a special upgrade!)

And my No. 1, all-time favorite: "Millennium-proof."

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Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Crazy, just crazy, about PDAs

Joseph E. Maglitta

Like many of your co-workers and users, I am crazy, just *crazy*, about handhelds and PDAs. You soon may be crazy yourself. Let's hope it's *good* crazy.

I know, you've heard plennnnty about palmtops and fingertops and other teeny tech-toys. But friends, it's been 15 years since PCs hit. Look how many IT folks still spit and cuss at them like cat-herders.

Let's not miss *this* boat, OK?

Almost overnight, PDAs have gone from Pretty Damned Awful to Pretty Darned Awesome.

Like it or not, personal digital assistants, aka PDAs, are here. Five million were sold last year and 8 million will be sold this year, according to research firm International Data Corp. Sure, many products still demand G. I. Joe fingers and a Mr. Magoo squint. Batteries in units with color screens barely last longer than a runway delay at O'Hare.

But almost overnight, PDAs have gone from Pretty Damned Awful to Pretty Darned Awesome. PDA-telephone hybrids, due out in the next year, should make things even more exciting. You ask: How can you be so sure, Mr. Smarty Pants? The answer is: I just know.

I'm not some stink-breathed gadget freak or fancy Lexus-driving consultant pushing a pricey new Mobile Architecture for Dinky Devices (MADD). No, I'm just a reasonably normal guy who travels a lot and has lots to track.

That's why I'm crazy for PDAs. Those serene green screens are my lost memory, my secretary, my mom, a silent majordomo who marshals my time, energy, trivia and dreams. Damn, I love those things! Especially Series 5 from Psion and 3Com's Palm III. Both are beautifully-designed and much-needed alternatives to Windows CE.

There are millions of pocket-happy Joes and Janes such as myself out there. Might this be a good time to reconsider how corporate technology adoption really works?

Imagine my upset, then, when my company recently informed me, "We don't have a PDA policy." Translation: "Buy it yourself." (My boss eventually told me to expense one.)

That's bad. After all, preventing *one* missed flight would pay for the darned device.

And imagine the hours I could save if I never had to copy phone numbers and appointments and to-dos between PC and date book. But nooooo — I'll have to improve knowledge worker productivity on my own dime, the Lords of IS informed me.

MORE THAN BUCKS

But it isn't just about money. It's about perception. After their PC experience, many users see a PDA and think: "Here's a simple, cheap, useful device. IS will hate it. Or doesn't even know about it."

If you cite policy — or lack thereof — to this jaded worker, you've just put another brick in the wall.

My advice is this: Make it easy or free for users to buy, fix, upgrade and use PDAs. Get people tuned into the best Web sites and freeware. Negotiate some bulk deals. Make a policy.

I'm not suggesting you toss one to every schmoe with an access card.

But buy and support PDAs for those who want and can use them, and you will have made a productive ally indeed. Don't wait until your new "nothing-smaller-than-your-head" policy draws an angry mob outside your office. (*"We're far/We're near/Keep your meat hooks off our gear!/We're wireless/We're tireless/You want 'em back? Then fire us!"*)

Those who forget technology history are condemned to receipt it.

You need to leap in front of this parade. If you don't, you probably *will* go crazy.

In the bad way.□

Maglitta is Computerworld's industry editor. His Internet address is joseph_maglitta@cw.com.

A jaded look at matrix management's rebirth

Michael Schrage

Some of my best friends are top managers. Really. As a general rule, they're pretty darn smart. As a specific rule, though, the most successful of the ranks are even savvier than they are smart. They play politics *very* seriously.

They aren't just project managers; they're campaign managers. They quote Drucker, but in the dark recesses of their corporate souls, they think Machiavelli. Don't mess with them.

That's why their reaction to the recent renaissance of "matrix management" in IT merits special attention. The goal of matrix management is, of course, to align IT and its digital phalanxes with the presumably profitable enterprise lines of business. The trend has been to get tekkies to report to both a technical boss (or a finance or operations boss) and a line-of-business boss to assure that appropriate collaboration/cooperation is seared directly onto the org chart. The bet is that this matrix alignment enhances cost-effectiveness, coordination, productivity and so on.

Of course, that structure is hardly a true matrix — but we all know that managerial and mathematical literacy are radically different animals. Actually, that two-headed management structure turns out to have a galvanizing impact both on how top managers insert themselves into technical turf topics and on how legitimate IT design and deployment disputes get resolved. Is that galvanizing impact a useful result of clever organizational design or the goal of what might be called "strategic cynicism?" You be the judge.

Let's begin with the simplest and most important question: Who really benefits in a matrix management structure? Then ask the logical follow-up: Who really gets to exercise power and influence?

The answers turn out to be simple and important: The key beneficiaries and power brokers of a matrix management structure are the top managers. No question; no doubt.

How so? My buddies explain: Matrix management guarantees there will be overlapping lines of responsibility and reporting among groups that have different goals, incentives and sensibilities. In other words, matrix management guarantees conflict. There's nothing wrong with conflict, of course. Managerial conflicts can be healthy and productive. But, according to my management Machiavellis, matrix management also guarantees that top managers must step in to resolve the very conflicts and disputes guaranteed by the organizational design.

The practice ensures plenty of conflicts – which top managers must step in and resolve

Clever, no?

Indeed, rather than foster collaboration and cooperation, matrix management foments heavy politicking to assure that the Big Guy (or Big Gal) cuts the IT baby in the right spot. In an era in which accountability and value-added involvement determine if you keep your job — let alone get added to the bonus pool — matrix management assures that the top tiers of the corporate pyramid get to play the peacemaker in debates between the tekkies and the lines of business. Blessed are the managerial peacemakers, for they shall inherit the options.

As a partner at a Hugely Profitable IT Consulting Firm told me: "Matrix management makes top management look fully engaged by making it so difficult for the IT and business managers who actually do the work to work better together."

Is that cynicism? Or is that simply good top-down management leadership? Or maybe, just maybe, you need to be a good cynic to be a great IT manager. Or am I now just being meta-cynical?□

Schrage is a research associate at the MIT Media Lab and author of No More Teams! *His Internet address is schrage@media.mit.edu.*

.WORK THE
WEB.

THe IT DiRECtOR is having heart palpitations in the elevator.

He hates giving speeches. In less than an hour he'll be in front of the entire IT department of the company. Rehearsing his speech in his head, he reminds himself not to forget to mention how successful the implementation of the new [1](employee self-service HR application) has been. The CEO will be there, so he also wants to point out that the [2](server consolidation program) and Y2K project are finished and, most importantly, within budget. The elevator doors open. His [3](pager) vibrates. It's an e-mail from his wife. She asks him to remember to pick up a tin of smoked eel on the way home. He bumps into the lead Webmaster in the hall who tells him that they've been able to take on new projects since they have dramatically [4](reduced the backlog) on Website change requests. He makes a mental note to say something in his speech about how well the Web team is doing. He looks down and sees, to his horror, that he's wearing two different color socks.

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IS half dead? Not by half

Allan E. Alter

Criminy, here we go again. On June 25, Gartner Group sent out an E-mail with this "sobering prediction" from the organization's latest report: "Within five years, only one-half of all enterprises will have an internal IT organization."

I say that's hooey; I keep thinking of that line from *Monty Python and the Holy Grail*: "I'm not dead yet!" But because Gartner Group gives this "Strategic Planning Assumption" a 0.9 probability rating — which is darn high in Gartner-speak — the chicken littles are going to start clucking that the sky is falling. Half of all IS organizations will shut down! IS departments are dying!

Let's debunk the Gartner Group's latest 'sobering prediction.'

Soon, the pundits who lap up that doom-and-gloom stuff will be wagging their chins over this latest so-called trend. CEOs, CFOs and others will read about it on airplanes and start to wonder if they should jump on the "abolish IS" vapor-wagon. Recruiters at consulting firms will whisper to your staff, "Join us — Gartner says there's no future in IS." Soon, you'll be stamping out all sorts of wild rumors.

So before all that gets going, let's do some pre-emptive debunking, shall we?

What does the report actually say? It says that companies will organize IT in one of four ways: as a business unit, by outsourcing IT, as centers of excellence or as a central "refocused IS organization." Only the latter, as far as I can tell, qualifies as an internal IS organization.

But if Gartner believes lots of IS organizations will be run as external business units or will be turned completely over to outsourcers, it's gone bonkers. Both approaches will remain where they are today: on the IS fringe.

Even former American Airlines CIO Max Hopper will tell you that running IT like an external business, as a profit center or with its own balance sheet is almost impossible to pull off. It creates all sorts of alignment and political catfights with line managers. Whose business is the real priority, they wonder — IS's or the company's? Those arrangements usually unravel. Many companies, including Banc One, Weyerhaeuser and Kimberly-Clark, have tried and failed.

General Motors' decision to restore its internal IS organization ought to make any CEO think twice. Outsourcing has its place, but total outsourcing means losing flexibility and control of your business destiny. Most CEOs think IS is too important and mercurial these days to give it all up. And although today's staffing shortage will push many companies to outsource, the gap won't last forever: Computer science and IS majors are becoming popular at universities.

So what's left of that 50% dissolution? Nada. Centers of excellence? Those are internal IS organizations, just organized differently. All the Gartner models show "local IT" groups operating inside business units or business lines. Maybe they aren't central IS, but they are definitely internal.

And those local IT groups don't operate in a vacuum. As the same report notes, companies are reviving the concept of a central IS organization.

The Gartner report simply restates what we already know: The IS function is changing. Users play a bigger part in managing technology. Relationship, project and contract management skills will be more important. Some technical capabilities will be outsourced.

But half of internal IT organizations gone by 2003? Don't believe a word of it. That's one "sobering prediction" that needs some sober consideration. □

Alter is Computerworld's department editor, managing. His Internet address is allan_alter@cw.com.

The perils of the portals

David Moschella

Portal: A gate or doorway, especially a great or magnificent one. Porthole: A hole or opening in a ship's side for light and air, or (formerly) for pointing a gun through — Chambers English Dictionary.

On Wall Street, Yahoo, Excite, Infoseek, et al. clearly are being championed as the former, but it's pretty easy to make the case that in the long run, they're probably more like the latter. Indeed, if you listen to how Internet users actually talk, many of us seem to utter something that sounds like a semiconscious fudge between the two: "Portoll?"

That verbal ambiguity captures my own mixed feelings regarding today's portal enthusiasm. The convenience, speed and numerous free services available at those sites significantly enhance the Web's overall value to a great many Internet users. On the other hand, the fact that the aggregation of such relatively basic services can capture so much media and financial market attention is powerful evidence of how primitive today's Web experience still is.

Perhaps more troubling is the fact that the stock price value of those sites has risen sharply even as their original search engine competencies have stagnated. It's been clear for a couple of years now that basic keyword searches often don't work particularly well, and yet little has been done to improve the situation. Indeed, one of the reasons the word "portal" has emerged so rapidly is that the relevant vendors don't want to be called "search engine companies" anymore.

But the need for a quality search capability hasn't gone away. Clearly, it will grow only as long as the amount of information on the Web continues to expand exponentially. However, to develop a top-quality search capability requires the one thing the current portal companies really can't afford to accumulate: specific human knowledge.

If you want to gather recent information about, say, the year 2000 problem or European Monetary Union, today's search engines certainly will point you to a great deal of relevant information. But the search process would be more useful if the resulting materials were grouped more into categories — technology challenges, legal ramifications, case studies and so on. The value would be even greater if the various sites or articles were rated by either readers or editors for their overall usefulness and quality.

That level of service never will be provided by generic portal providers but is beginning to emerge from today's so-called content companies. Whether the issue is technology, economics, health or anything else, organizations with specialized knowledge are best positioned to provide the required editorial and filtering capabilities. Companies are beginning to realize that the last thing the Web needs now is more content; it's easier to create new value by better leveraging what already exists.

It's a precarious business indeed that is built around customers' wish to get somewhere else.

As those knowledge-driven services grow, the vulnerability of today's portal businesses will become clear. I see them as halfway houses — places you have to go for a while in order to get where you really want to go. As our final Web destinations become ever more useful and easier to find, the need to spend time with intermediaries will drop steadily.

Ultimately, it's a precarious business indeed that is built around customers' wish to get somewhere else as quickly as possible. That is apparently what the Web needs today, but it's hardly the foundation of the future. Portals today; portholes tomorrow. □

Moschella is an author, independent consultant and weekly columnist for Computerworld. His Internet address is dmoschella@earthlink.net.

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GONE FISHIN'?

Only 19% of vacationing managers plan to avoid contact with their companies. The rest must leave an itinerary or check in via some kind of electronic leash.

Source: Survey of 1,000 managers

Utility: Training app helps, but not enough

By Barb Cole-Gomolski

SOUTHERN CALIFORNIA GAS (SCG) uses software to track the tasks associated with certain jobs and now is looking for a way to seamlessly turn those descriptions into training courses.

ELECTRONIC CLASSROOM

If SCG can do that, it will reduce the cost of developing a training course by one-third to one-half, according to John Stormes, the utility's instructional design supervisor.

Like many companies, SCG is trying to train its employees less often in classrooms and more often on PCs. According to a 1997 survey of 540 U.S. companies by the American Society for Training & Development, a trade group in Alexandria, Va., the use of intranets for training will increase 17% by 2000. CD-ROM training will grow by 20% during that time, the survey showed.

But as SCG is learning, getting to the point where more training is done electronically isn't always easy.

About four years ago, the Los Angeles-based utility installed Integrator Pro, a software package from Applied Courseware Technology, Inc. in Fredericton, New Brunswick. At that time, it wasn't uncommon for two of

Training software, page 36

Payment system saves builder's time

▸ *NT servers and database replace AS/400 files*

By Sharon Gaudin

CONSTRUCTION COMPANY Cianbro Corp. has found that its business is as much about moving information as it is about pouring cement.

The Pittsfield, Maine-based company handles maintenance and construction projects for large manufacturing companies and builds bridges under government contracts.

Its 1,500 employees operate job sites from Maine down the Eastern seaboard, where they typically install and maintain machines that can be as big as a city block.

To get the contracts it needs to survive in an increasingly competitive industry, Cianbro must stay on top of costs and expenses and analyze that information for customers and its executives almost in real time. But it was being held back by its computer system — an AS/400 that stored financial information in unconnected files rather than a database. Collecting spending data meant a slew of paperwork and lags in reporting time.

It was time for a change.

Tim Stauder is a Cianbro project engineer at Mead Corp., a paper mill in Rumford, Maine, a town in the state's western hills that relies on the mill to employ a vast majority of its citizens. Part of his job, which doesn't require a hard hat and steel-toed boots, is keeping the customer apprised of how its money is spent.

"If you rip into a machine and find a foundation back from 1885 or we find a bunch of junk, we've got to know right away and get some money to take care of that problem," Stauder explained. "Or if we find a way to save money, we've got to let the customer know so they can use that money in another project somewhere else."

The problem was that there was too much lag time between when Stauder or the crew analyzed a job — what needed to be done, how much it would cost, if it would be under or over budget and how long it would take — and when the

Builder, page 36

Cianbro's Tim Stauder: Old AS/400 systems made assessing and analyzing costs difficult

RBOCs hire Bellcore for Y2K testing

By Matt Hamblen

A GROUP of regional telephone companies has hired consultancy Bellcore to supervise year 2000 testing of their networks, but network users are worried the tests won't be thorough enough.

"We think it's a little late, but it's positive, and Bellcore is a really good firm," said Ruth Michalecki, chairman of the International Communications Association (ICA) in Dallas.

But network users are worried that the tests won't involve long-distance carriers or end users such as banks and manufacturers that depend on networks for moving financial and supply-chain data, Michalecki said. A spokesman for the regional phone companies confirmed that the tests will be restricted to members and that no end users will be involved.

Users ask how a network can be truly tested if all parties aren't involved in the test. "The

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Corporate Strategies

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Security/Citibank deal

Security First Technologies, a wholly owned subsidiary of Security First Network Bank in Atlanta, has signed a multiyear, multimillion-dollar contract with Citibank in New York to process a portion of its Internet-based banking transactions. Citibank previously licensed rights to Security First's financial services applications last August.

Sabre seeks bugs

Sabre Technology Solutions, a division of The Sabre Group in Fort Worth, Texas, has signed a contract to use Dallas-based MigraTEC, Inc.'s year 2000 impact analysis software tools for client/server applications written in C and C++ and IBM OS/2 applications being migrated to Microsoft Corp.'s Windows NT. Sabre's use of the MigraTEC tools on behalf of one of its transportation industry clients is expected to reduce the analysis phase of the project by several weeks.

Faster 'net links

Comdisco, Inc. in Rosemont, Ill., has made a $75 million equity and leasing investment in Transwire Communications, Inc., a start-up in New York. Transwire will install and operate an advanced digital communications network using Nortel, Inc.'s DMS 100 switches and 1M bit/sec. modem technology that lets data run downstream over copper lines at near T1 speeds. That will let Comdisco's corporate customers reach Internet connections 17 times faster than by 56K bit/sec. connections.

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Only 19% of vacationing managers plan to avoid contact with their companies. The rest must leave an itinerary or check in via some kind of electronic leash.

Base: Survey of 1,800 managers

Source: American Management Association, New York

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The problem was that there was too much lag time between when Stauder or the crew analyzed a job — what needed to be done, how much it would cost, if it would be under or over budget and how long it would take — and when the

Builder, page 36

Cianbro's Tim Stauder: Old AS/400 systems made assessing and analyzing costs difficult

RBOCs hire Bellcore for Y2K testing

By Matt Hamblen

A GROUP of regional telephone companies has hired consultancy Bellcore to supervise year 2000 testing of their networks, but network users are worried the tests won't be thorough enough.

"We think it's a little late, but it's positive, and Bellcore is a really good firm," said Ruth Michalecki, chairman of the International Communications Association (ICA) in Dallas.

But network users are worried that the tests won't involve long-distance carriers or end users such as banks and manufacturers that depend on networks for moving financial and supply-chain data, Michalecki said. A spokesman for the regional phone companies confirmed that the tests will be restricted to members and that no end users will be involved.

Users ask how a network can be truly tested if all parties aren't involved in the test. "The

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Training software

CONTINUED FROM PAGE 35

SCG's 50 instructors to teach the same course using different material because it was hard to match job descriptions with specific training requirements.

The training courses include everything from customer service and billing to field construction and repair.

Integrator Pro includes a database that lets SCG track the tasks associated with certain jobs and information about the individuals who need training. The software has made changing courses easier, reduced overlap and given managers a way to track exactly which tasks employees have been taught.

"Sometimes if there is an accident in the field, someone will say, 'I was never taught that,'" Stormes said. "Now we can go back to their training records and show that he or she passed performance tests that prove they knew the correct procedure after training."

Though Integrator Pro lets users create a set of course objectives by listing the tasks associated with a job, it doesn't actually create the electronic course work. SCG uses a separate package — Multimedia Integrator, also from Applied Courseware — to build the actual course, whether it be computer-based or video.

Because the trainers who create the courses often aren't the ones who document the tasks that go with a job description, Multimedia Integrator "requires instructional designers to learn about the subject matter in order to develop the course," Stormes said.

If specialists could put together course requirements from task information in Integrator Pro and course designers could create the courses using the information, it would eliminate a "huge hidden cost" of electronic course work, he said.

A spokesman for Applied Courseware said the company plans to integrate the two functions by year's end.

Stormes said he has considered switching to a different software package, but none of the ones he has looked at can import the data currently stored in Integrator Pro. Cost is also an issue. Most of the packages Stormes has looked at are more expensive than what he uses now.

OTHER HURDLES

Even if designers solve the problem of developing multimedia courses, they face other challenges, according to users. For example, a glitch in trying to move to electronic ways of training is that people "are just too busy" to take time out of their workday to use computer-based training, said Deborah Barrett, manager of associate training at Automatic Data Processing in Hoffman Estates, Ill.

But when users are pulled away from work and given "doughnuts and an instructor," they are more likely to focus on the training, she said.

Lynn Ware, president of Integral Training Systems, Inc. in Half Moon Bay, Calif., said SCG is in the minority with its approach to creating training materials. "Most companies outsource this because they don't have the internal staff to do it," Ware said. Even if they have the staff, the quality of the training produced in-house may not be up to par, she said. □

RBOCs hire Bellcore

CONTINUED FROM PAGE 35

public-switched telephone network works remarkably well, but it has many, many links run by multiple carriers on one connection," Michalecki said.

The ICA has 350 user companies, many with international operations, and they rate year 2000 interoperability testing as a "very high concern," according to Michalecki. "We're concerned the network might be fine in my neighborhood, but not the neighborhood I'm trying to reach."

User companies in the Information Management Forum in Atlanta also are concerned. "It's not just companies sending [electronic data interchange], but we have end users sending stock trades and banks with ATMs and car companies running inventory on networks," said James A. Jones, managing director of the group, whose 50 company members include General Motors Corp. and Ford Motor Co.

"You could have 7,999 miles of network tested to work, but if the last mile doesn't work, it's no good," Jones said.

GROUP EFFORT

The regional carriers created the Telco Year 2000 Forum in 1996 specifically to share information about year 2000 fixes. Members are Ameritech Corp., Bell Atlantic Corp., BellSouth Corp., Cincinnati Bell, Inc., GTE Corp., SBC Corp., Southern New England Telephone Co. and US West, Inc. Forum members said they hired Bellcore, in Red Banks, N.J., to save time and money.

Notably missing are long-distance carriers and hundreds of smaller phone companies. The largest long-distance carriers have said they are working together on year 2000 fixes through the Alliance of Telecommunications Industry Solutions in Washington, but Jones said that group's plans for interoperability testing apparently don't include all the regional carriers or smaller companies.

"Members of my group are not happy with what they're hearing," Jones said.

Michalecki said the Federal Communications Commission in April re-established the defunct Network Reliability Council to address year 2000 needs, but she added that the FCC needs "to get the council in high gear."

FCC officials said the Network Reliability Council would coordinate sharing information about fixes and testing by individual carriers, but Michalecki said the council hasn't moved quickly enough. □

Builder

CONTINUED FROM PAGE 35

customer got that information.

"It's been so difficult to get information out of the o'd system that people have been keeping personal spreadsheets on their desks," said Vera Bryant, a systems analyst at Cianbro.

Stauder said the company's financial reports even fell as far as a few weeks behind because it took so much spit and gum to paste together results from different files. So the company decided to replace the systems with two Windows NT servers and an Oracle Corp. database. It also replaced a 10- to 15-year-old software package weighed down with sci-fi-like character commands with a new Windows-based construction business management package from Computer Methods.

Now, there is no need to splice data because it all resides in one place. And it is easier to get timely financial and tax-related information to companies that hire Cianbro.

"This new system is not going to help a pipe fitter lay pipe faster, but it will help us manage our money better," Stauder said. "We're spending our customer's money here, and we need to be able to tell them where it's going."

"The new system is intended to support more of our business than any one system has ever done before," said Chief Financial Officer Tom Stone. "We are positioning ourselves for an overriding focus on cost as the business grows."

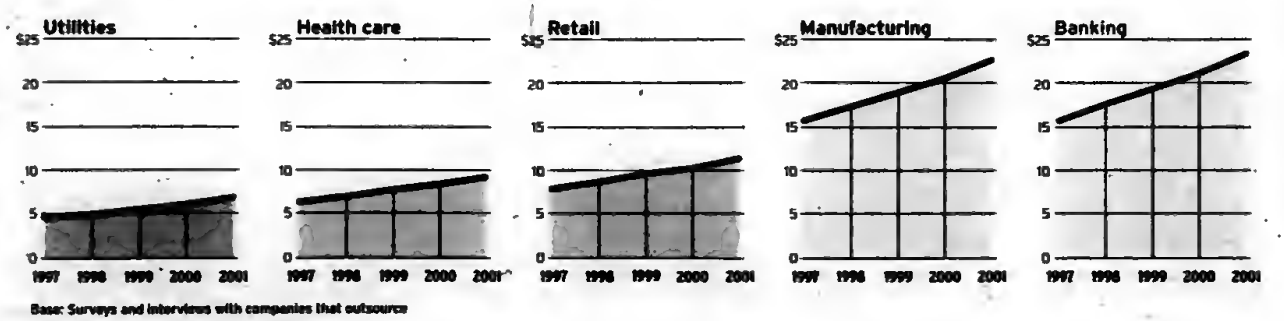
Being able to easily meld and analyze that information is what will keep a company like Cianbro alive in a competitive industry, according to Evan Quinn, an analyst at International Data Corp. in Framingham, Mass.

"Construction companies deal with a vast amount of information and they need to have this information at their fingertips to get contracts and keep contracts," Quinn said. "They have to fill a customer's information needs and their construction needs."

Stauder agreed. "Ten years ago, a construction company might have had one accountant overseeing a job worth $10 million," he said. "Today, the bean counters have taken over. They calculate what this investment will return for them. It all has to be there, or there's got to be a good reason why." □

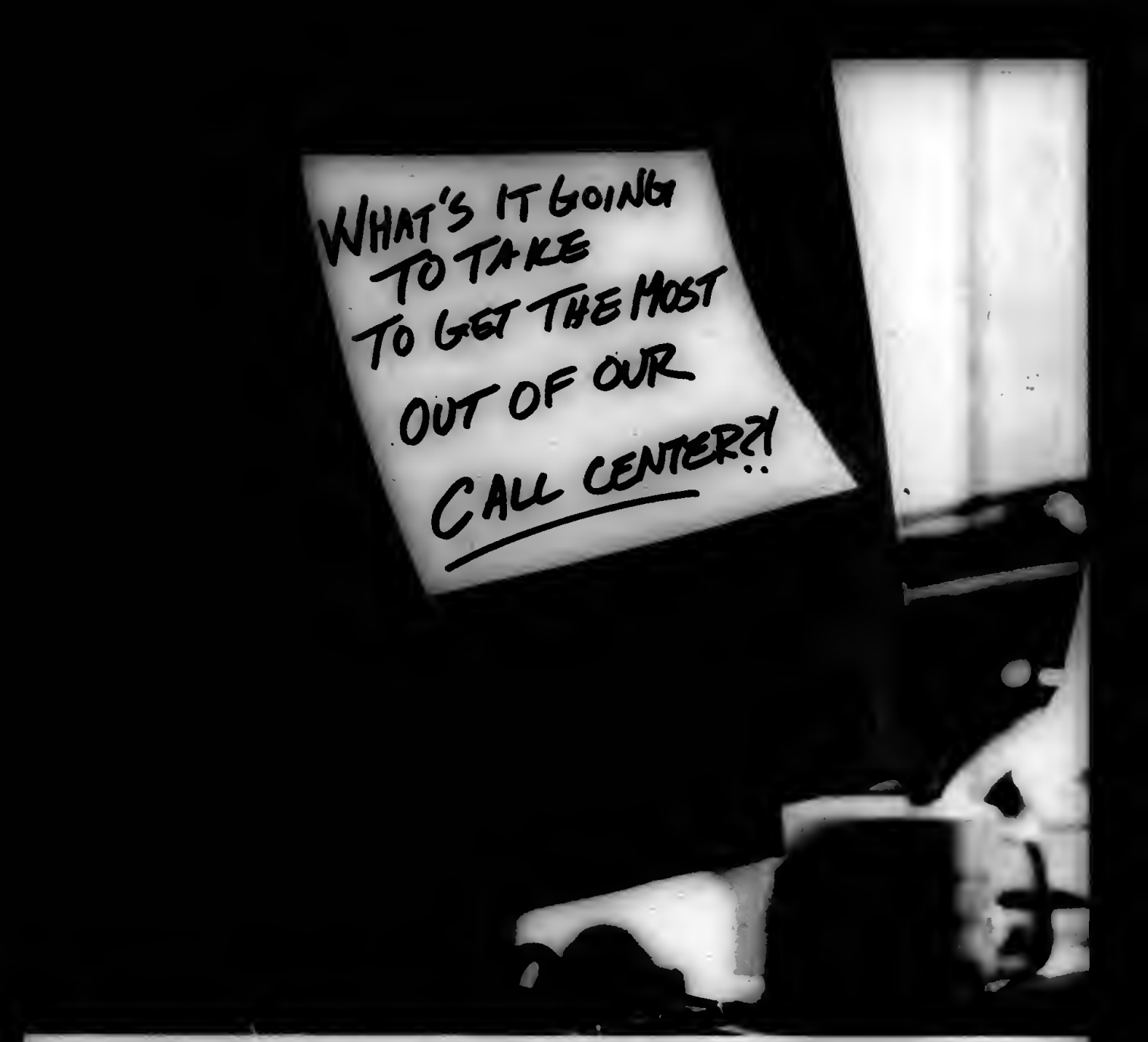
Snapshot

Worldwide outsourcing spending by industry, 1997-2001 (in billions)



Base: Surveys and interviews with companies that outsource

Source: International Data Corp., Framingham, Mass.



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Internet Commerce

Electronic Commerce • The World Wide Web • Intranets

Briefs

Encryption study slams

The Public Network Integrity Project, the Public Policy, a data-privacy think tank, has weighed in on the cryptography debate with a study that argues that unrestricted use of encryption is the only way to keep companies' computer networks and their customers' data secure from hackers and other criminal activity online. The paper, titled "U.S. Encryption Policy: A Free Market Primer," can be found at www.pnip.org/research.html.

Europe 'not sales ripe'

Despite concerns over the gap between the U.S. and Europe in online revenue from consumer sales and businesses, and governments need to take urgent action to ramp up electronic commerce, according to a report. The U.S. accounted for 85% of total global Internet-based revenue last year, according to a white paper recently published by the Interactive Media in Retail Group, which promotes electronic commerce. European companies aren't moving business to the World Wide Web, and Europeans don't seem as interested as North Americans in buying online, the report says.

Health care recruiting

Health care giant Humana, Inc. in Louisville, Ky., has launched a Web site where visitors can learn about and apply for jobs at the company. The site (www.humana.com/careers) lets users find jobs by location, corporate division and keyword.

Community banks' Internet plans

Plan to have Web sites by year's end	55%
Have Web sites	29%
Plan to enable Internet transactions this year	13%
Allow Internet banking transactions	2%

Base: 600 community banks

Source: Grant Thornton LLP, Chicago

Bridgestone boosts service

▸ *Extranet gives dealers easier access to data*

By Sharon Machlis

THERE'S MORE TO Internet commerce than money.

In fact, Bridgestone Firestone, Inc. rolled out an extranet in the spring that company officials said isn't necessarily geared to cut costs or bring in new sales.

Instead, the system was designed to offer better information and more convenience for its tire dealers. "Our dealers have been asking for this type of service," said Lori Jones, manager of electronic commerce at Bridgestone Firestone in Nashville.

The extranet lets dealers check order status, get information and prices on new products and submit information about deliveries.

Of course, keeping dealers happy helps lock in revenue in the long run. "You don't want your partners to find out if they partner with someone else, their life will be easier," said Tim Sloane, an analyst at Aberdeen Group, Inc. in Boston. "Customer retention is right up there" as a reason to deploy an extranet, he said.

For now, only about a dozen of the company's 8,000 or so dealers are joining the project, but more than 400 dealers have expressed interest in using the

Bridgestone, page 42

Shipper helps bills of lading go digital

By Carol Sliwa

AS PART OF AN EFFORT to improve data accuracy and cut costs in the supply chain, Federated Department Stores, Inc. notified its suppliers that it wants all bills of lading — the legal documents used in shipping freight — to be transmitted electronically by Aug. 1.

FREIGHT INDUSTRY

But a sizable chunk of the Cincinnati-based chain's electronic data interchange (EDI) initiative is being implemented by one of its major shippers, Roadway Express, Inc. in Akron, Ohio, and 1,600 Federated

Lading bills, page 42

Keep on trackin' – using the 'net

By Patrick Dryden

TRUCKING COMPANIES must all deal with the same speed limits, load restrictions and time constraints to serve their customers. Seeking a competitive edge, Schneider National, Inc. has once again put its information systems group in overdrive.

The $2.5 billion carrier in Green Bay, Wis., pioneered satellite trackers to watch its fleet of 15,000 trucks traverse North America. Now it has embraced the Internet as a sleek alternative to clunky data exchanges among systems.

Customers who outsource part or all of their transportation management chores to the Schneider Logistics, Inc. subsidiary can trace any shipment

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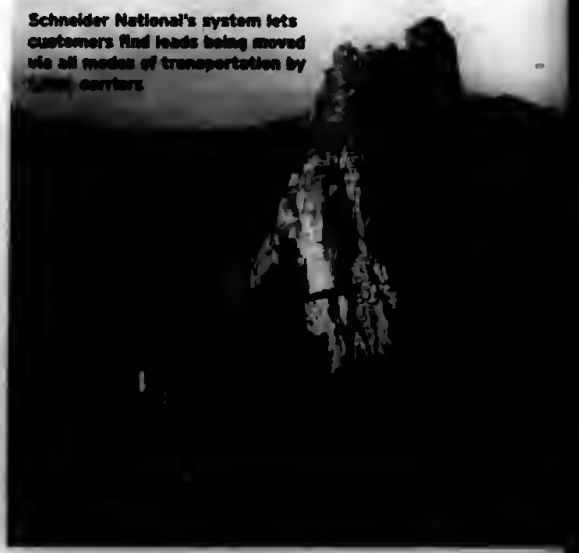

Schneider National's system lets customers find loads being moved via all modes of transportation by [illegible] carriers

Server readies Saab data for Web

By Jaikumar Vijayan

WORLD WIDE WEB technologies are driving new applications at Saab Cars USA, Inc.

The importer and distributor of Sweden's Saab cars is using Web-to-host technology to create a network that links 225 dealers across the U.S. and back to its Norcross, Ga., headquarters.

The move, which is aimed at improving communications between Saab and its dealers, is part of a broader effort to improve overall customer satisfaction, said Jerry Rode, director of information systems at Saab.

OWN THE ROAD

Business objective: Improve customer satisfaction and service throughout Saab dealerships.

Technology: Build an intranet that gives dealers browser-based access to warranty, service, sales, finance and dealer management data on systems at Saab's headquarters.

Saab is one of a growing number of organizations that use the Web to not only preserve their legacy system investments, but also to carry them forward, said analyst Heather Ashton at Hurwitz Group, Inc. in Framingham, Mass.

"It is interesting from the perspective that Saab is using the Web as a means to solve a technical issue as well as a business issue," Ashton said.

For instance, giving dealers easy browser-based access to in-house Saab information on parts shipment, warranty, service, sales and finance increases dealer productivity and reduces costs, Ashton said. Previously, dealers had to dial in to Saab's systems — sometimes in to two separate systems — each time they wanted such information.

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Internet Commerce

Electronic Commerce • The World Wide Web • Intranets

Briefs

Encryption stops crime

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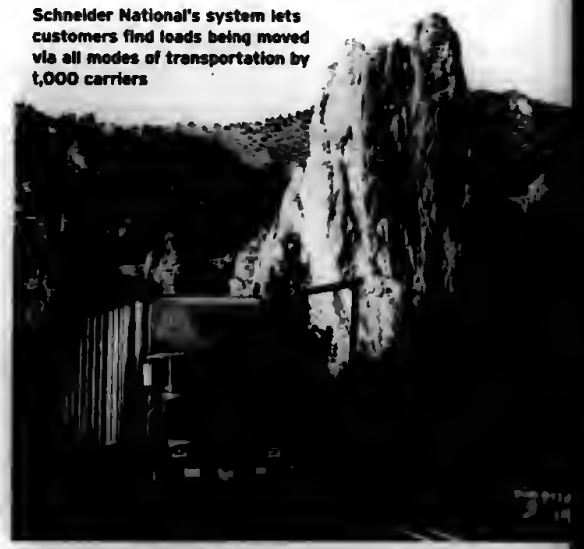

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Bridgestone

CONTINUED FROM PAGE 41

extranet. "We see it as a very strategic tool for us," Jones said.

Although there were a few glitches at the outset with performance and the speed at which data was updated, those were worked out early on, said Matt Kehrt, an early user of the system at S&S Tire, Inc. in Lexington, Ky. Now, he added, "it's pretty much got everything we need."

CUSTOMER SERVICE

S&S Tire uses the system to check on shipments and process delivery receipts from associate dealers that provide service to national and government accounts, he said.

Before, dealers could check on order status only by calling Bridgestone Firestone, and receipts were processed on a proprietary network that was costlier for the company and required specialized software for the dealers. Now the dealers need only Internet access and a browser, which many of them already have. The system took about a year to develop, from the time the project team was created in April 1997 to the general unveiling to dealers in April this year. Because a lot of equipment was already in place for the company's Internet and E-mail activities, Bridgestone Firestone purchased just two new servers for about $30,000 on the hardware side. The company used Raleigh, N.C.-based Haht Software, Inc.'s products to move data to the Web from its legacy applications.

A FIRST

Phil Brown, lead World Wide Web technology advisor at Bridgestone Firestone, said he believes the site was one of the first to use Haht's distributed application server technology that lets the Web server sit outside the firewall and the application server remain behind it.

"At the time, that was pretty revolutionary," he said.

He said that architecture is more secure because the call from the application server into the legacy systems is protected behind the firewall. □

Saab readies data

CONTINUED FROM PAGE 41

At the same time, by using Web-to-host access technologies, the company can provide the new functionality without sacrificing its legacy investment.

Saab, which is partly owned by General Motors Corp., last year sold about 28,450 cars in the U.S.

In building the network, it relied on technology from CST, Inc., an Atlanta-based vendor of host access products, to Web-enable data on its IBM S/390 mainframe and its AS/400 midrange server.

CST's Jacada Server converts legacy user interfaces to a pure Java graphical user interface. In Saab's case, all of its previous "green screen" user interfaces were converted to modern graphical interfaces, Rode said.

The server also connects Saab's mainframe and AS/400 system so dealers can access data from either system with ease.

The setup minimizes the software and hardware required by dealers and does away with the need for servers at each dealer location, Rode said.

"Our dealers carry multiple brands, and every manufacturer requires dealers to use their own systems" to keep in touch, Rode said.

"That's why we decided to go with a serverless approach. It really frees the dealer," Rode said. □

Lading bills go digital

CONTINUED FROM PAGE 41

merchandise suppliers that use Roadway.

Roadway earlier this year began a program to help those suppliers comply with the Aug. 1 deadline. It offered the following two options:

- Use Roadway's free EDI-compliant ExpressWorks software to create electronic bills of lading and transmit them via modem and toll-free phone number. Roadway, in turn, electronically sends shipment status messages to Federated, owner of such department stores as Macy's and Bloomingdale's.
- Work with Sterling Commerce, Inc. to get existing EDI systems up and running with the new year 2000-compliant "211" bill of lading forms designed for shippers carrying less than a full truckload of merchandise. Roadway pays Sterling for the EDI document certification.

But implementing the new system has been a challenge. Because automating bills of lading won't benefit the merchandise suppliers to any great degree, Roadway has had to convince many of them that the work is worthwhile, acknowledged Martha Lucey, the company's market manager of electronic commerce.

"Data integrity means their goods move through our networks faster, move through Federated's docks faster and to the sales floor faster," Lucey said. "That means, potentially, they can sell more."

Not everyone may see that benefit. Richard Rieckenberg, EDI manager at Nambe Mills, Inc., an Espanola, N.M., maker of metal home-furnishing accessories, said, "The only advantage is my partners are happy." That doesn't mean he is complaining. "It's just a cost of doing business," he said.

"It doesn't take very long to do the 211, so it's not very much of a burden," Rieckenberg said. "We fill out bills of lading manually anyway, so doing them electronically only adds about two hours a week."

A bill of lading, the legal document used to tender freight, includes:

- Shipper's name, address and identification number
- Receiver's name, address and identification number
- Pickup and delivery dates (if available)
- Description and weight of freight being shipped
- Payment information
- Purchase order number (optional)

In the past, Roadway picked up a paper bill of lading from the supplier when the truck arrived. Later that night, Roadway staffers would key the information into the system. With 407 facilities in the U.S. keying in data, the potential for human error was a constant concern.

Drivers sometimes spent 30 minutes to more than an hour hung up at the Federated receiving dock trying to reconcile a purchase order number with the shipment count, according to Lucey.

"Now the data is exactly what the [merchandise] vendor says it is," said Donna Dukes, a vice president at Federated's logistics and operations division in Secaucus, N.J.

Federated said the electronic bill of lading is a Voluntary Interindustry Commerce Standards Association standard that was first communicated to its merchandise vendors in the 1996 issue of the vendor technology standards manual.

Steven Bell, an analyst at Forrester Research, Inc. in Cambridge, Mass., said Federated is joining the trend of trying to manage its flow of goods. "It's allowing them to shave inventory level and better coordinate inbound and outbound shipping from their warehouses," he said.

With the Federated deadline rapidly approaching, both Roadway and Sterling still have plenty of work to do. About 800 of the 1,600 Federated suppliers that use Roadway haven't committed to test the new electronic bills of lading, Lucey said.

"Some customers who aren't doing EDI need a lot of information before they're willing to commit to a test," she said.

Federated said it will charge suppliers that don't use the electronic bills of lading "reimbursements for expenses we incur" to handle shipments.

For some suppliers, that may be less expensive than setting up an electronic bill of lading system, Lucey said.

Still, if the Federated test case proves successful, Roadway plans to promote electronic bills of lading to other suppliers in the retail and automotive industries, "the ones pushing the EDI envelope the most," Lucey said, "because of the benefits to everybody involved." □

Keep on trackin' – on the 'net

CONTINUED FROM PAGE 41

via the World Wide Web. They can query a constantly updated data warehouse to locate parts to feed a just-in-time production system, for example, without having to translate their request to commands or figure out which carrier has what cargo.

It is the scope of service that is unique here, as other carriers and overnight delivery services also offer Web-based tracking of their own shipments, said Dick Armstrong, president of Armstrong & Associates, Inc., a consultancy in Stoughton, Wis. "What's important is not just this access feature, but the link with the rest of Schneider's software that can track any carrier," Armstrong said.

The system unifies data about all modes of transportation — including truck, rail and small loads consolidated on one truck — in a base of 17,000 carriers, said Chris Lofgren, chief technology officer at Schneider National.

The new Web-based track-and-trace system attempts to "give customers more visibility to what's moving where and when," Lofgren said. Besides being able to check shipments at any time from any browser, customers can ask for information using simple dates, locations and their own internal reference numbers.

Other carriers can put an Internet face on a system that tracks shipments entirely under their control, but Schneider Logistics has made its comprehensive electronic data interchange system more flexible and accessible, Armstrong said. That evolution should lower the entry cost to attract smaller customers, he said.

"This really opens up our whole freight operation system, puts it under customer control so they can turn data into strategic information for themselves and for their customers, too," said Sharon Lintereur, project manager for Schneider National's technical staff.

That is the goal for Pittsburgh-based PPG Industries, Inc., said beta-tester Jim Carr, manager of the corporate transportation center. The new option from Schneider will "help us get rid of an expensive, outdated mainframe load-control application that isn't timely and keeps running into network problems when we try to pass EDI information among systems," Carr said. □

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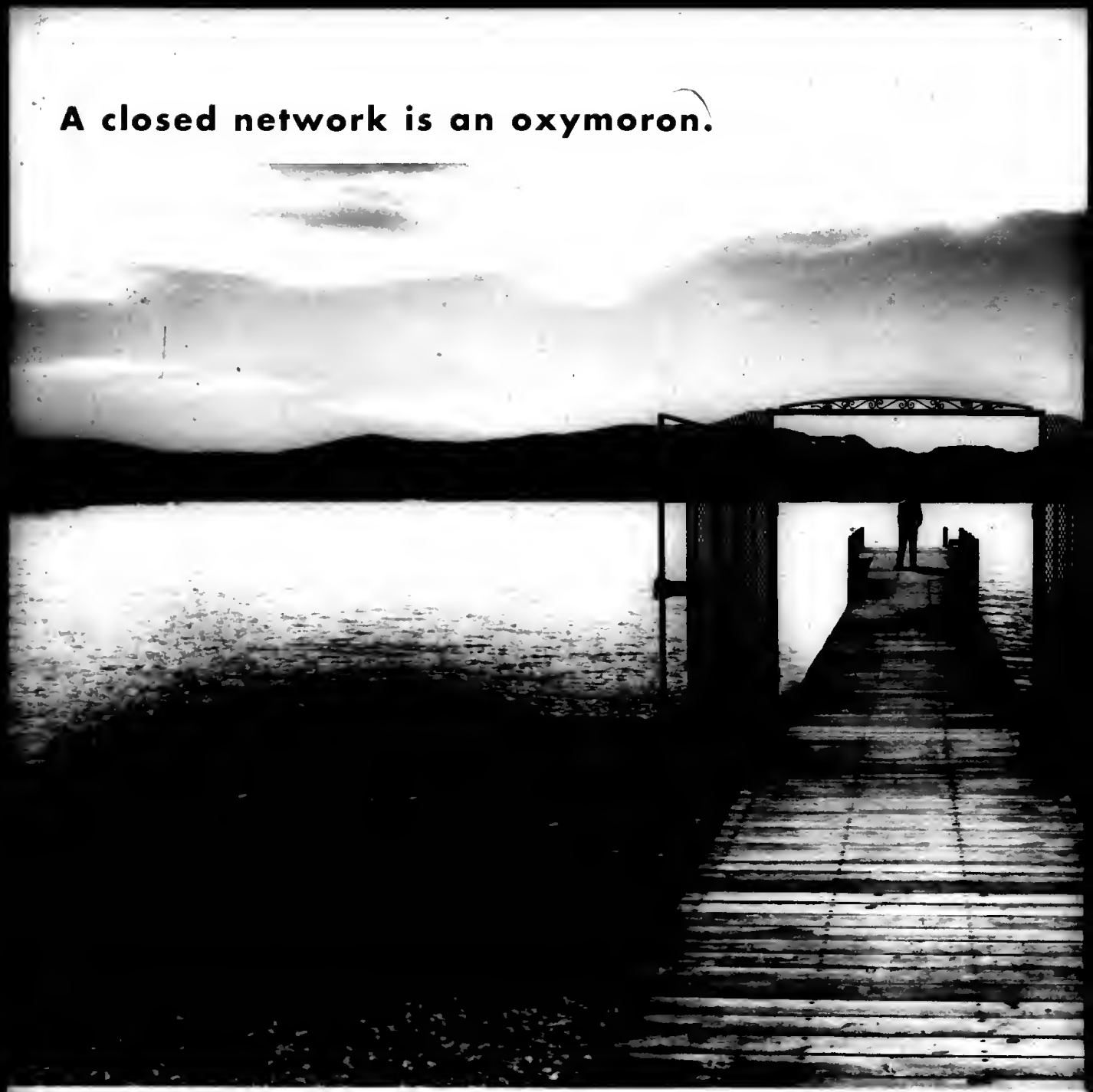

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Briefs

VPN INDEX

Virtual private networks (VPN) save wide-area networking costs by encrypting data and sending it over the Internet

11% of large businesses (with more than 1,000 employees) use VPNs

23% of midsize businesses (100 to 1,000 employees) are evaluating VPNs

A VPN is in strategic plans for 2000 at:

43% of small businesses (fewer than 100 employees)

55% of midsize businesses

54% of large businesses

Base: Interviews with 50 IS and Internet managers from five vertical markets (federal government, finance, health care, manufacturing and trade)

Source: Cahners In-Stat Group, Newton, Mass. (formerly Business Research Group)

Insurer cuts access costs

▸ *Virtual network reduces modem bills 90%*

By Laura DiDio

A NEW VIRTUAL private network (VPN) has helped a California auto insurance company cut the cost of remote access to its computer system by 90% and has given it more secure and reliable connections to its underwriters.

Reliant General Insurance Services, Inc. in San Diego had made do with modem links to connect its relatively small number of underwriters via modem lines.

But in January 1997, California made auto insurance mandatory for all drivers, and millions rushed to sign up.

Reliant General, which deals in high-risk general insurance, saw its business explode. It has hired new underwriters almost every month to keep pace with the growth, according to Cary White, the company's director of MIS. Reliant General had 10 underwriters three years ago; it has 85 now.

But even though company officials were happy to see revenue climb to $100 million annually and to sign up 80,000 new California policyholders, the increases came with a cost: soaring remote access phone bills from underwriters, who all work from home.

"The 28.8K bit/sec. modems were not only too slow and insecure, but the cost was astronomical," White said. "At $10,000 to $12,000 a month, the remote access phone bills were nearly as much as our office phone bills. We also wanted to keep our customers' information private."

Remote access phone bills were nearly as much as office phone bills

Reliant General replaced the dial-up modems with Axent Technologies, Inc.'s PowerVPN, which includes specialized software for underwriters' PCs. To connect, underwriters type a personal identification number (PIN) for the software on their PCs, and a software token authenticates them to the PowerVPN gateway using a password that it generates on the fly. Security software on the PowerVPN server recognizes the token and controls what users can access on Reliant's network.

"With the remote access VPN, the phone bill has dropped to $1,200 a month," White said. That's because telecommuters access the network through a local Internet service provider. The cost of the Axent PowerVPN, including the T1 line, routers, firewalls and installation and consulting fees, was $19,000.

Insurer, page 48

Outages no longer shut out users

By Julia King

WINSTON MOATON has a very simple, yet highly reliable, method for measuring user satisfaction.

"If they're not yelling at you, everything is going OK," said the network project manager at Nova Scotia Power, Inc.

Ever since March 1997, the Halifax-based utility's 1,000-plus network users have been pretty quiet. That's when the company upgraded from a 5-year-old Fiber Distributed Data Interface (FDDI) system to its current Asynchronous Transfer Mode-based network, which links its downtown offices to the corporate data center about 10 miles away.

Comprised of two primary and two secondary 3Com Corp. switches with speeds ranging from 155M bit/sec. to OC3, the upgraded network connects sev-

Outages, page 48

You have E-mail; find a pay phone

▸ *Mobile users get connected with unified messaging*

By Roberta Fusaro

GWEN COSTA, a Chicago-based independent contractor for Ernst & Young LLP's management workshops division, lives by her E-mail. Because she receives a continuous stream of work assignments and information primarily by E-mail, she can be lost without it. Literally.

Like on a recent trip to Boston, when Costa didn't get the word that her work team had changed a meeting location. "[The group] sent an E-mail and had called the hotel to let me know," Costa said, but she didn't have time to stop at the hotel or plug in a laptop computer to check for E-mail. "So I wasted two or three hours trying to figure out where the team had gone," she said.

Costa now uses CoolMail, a service from Glencoe, Ill.-based Planetary Motion, Inc., to listen to her E-mail messages over the telephone for free.

CoolMail users get free E-mail accounts or can tell the service where it can collect their E-mail. CoolMail software crawls through the accounts looking for E-mail headers.

A user dials in to a toll-free or local number, then enters a personal identification number and password to access the CoolMail server.

An automated attendant — text-to-speech conversion software — reads back the messages.

CoolMail is one of several unified messaging products — software that will let users collect all their mail in one in-box for easy access — that are trying to address the needs of mobile users.

Others are from Los Angeles-based JFax.com, which handles fax and voice mail and Internet-based E-mail; IPost from San Jose, Calif.-based start-up MediaGate, Inc., which offers one in-box for fax, voice mail and E-mail; and the MailCall

E-mail, page 48

Outages

CONTINUED FROM PAGE 47

eral dozen servers that run a mix of operating system software, including NetWare, Windows NT and several flavors of Unix.

The 15-month-old network, upgraded at a cost of $500,000, also supports an intranet that contains scheduling data, company policies and other employee information.

Installing a faster, more reliable network was necessary so users of the company's most critical application — a customer information system, also recently upgraded — could quickly access billing and other data they needed to provide around-the-clock service to the utility's 415,000 business and residential customers.

Before the upgrades, network outages, including those for scheduled repairs, idled the customer information system and other applications. "There could be outages after 10 p.m., and customers would call in, but users couldn't get the information they needed," Morton explained. That hurt Nova Scotia Power's efforts to improve its customer service — something all utilities are looking to do as deregulation and increased competition bear down on them, said Brad Holcombe, a partner in the utilities practice at Andersen Consulting.

HOW IT WORKS

The four-switch ATM network is configured as two distinct but interconnected networks. That means maintenance can be done on the primary network while users continue to access customer data using the secondary network. That setup effectively doubles the cost of the network, but it is the only way to provide the redundancy and high availability Nova Scotia Power required, Morton said.

"Our Novell servers sit directly on the ATM network, so if we happen to lose an ATM switch, the servers automatically switch over to the secondary network, which is live all the time," he said. "This way, you also have an automatic way to recover in the event of a disaster."

Another advantage of ATM is the ability to increase bandwidth and add new physical locations to the network without making changes to existing switches or other components.

"The scalability and reuse of technology are two of the key benefits of going to a switched network," Morton said. "You can reuse the equipment that you currently have on-site rather than do a forklift upgrade, where you pull everything out and build everything new." The ATM network, for instance, started as a two-switch network. The two additional switches were added a year later for full network redundancy.

In the utility's call center, which receives all incoming consumer complaints and other requests for service, users are particularly sensitive to outages, said Jay Webb, the company's Novell network administrator. Webb functions as a liaison between users and the company's 10-person networking group.

"Before, with the FDDI network, they could take calls, but they couldn't get the information they needed, which really limited them in helping customers," Webb said. Since the ATM network was installed, he has heard very little from those users, he added. □

NEW PRODUCTS

D-LINK SYSTEMS, INC. has announced the DES-810E, a 10-port Ethernet/Fast Ethernet switch designed for small workgroups.

The Irvine, Calif., company said the palm-size switch offers eight 10M bit/sec. and two 10/100M bit/sec. connections. The two dual-speed ports automatically negotiate to the higher speed. Users can specify half-duplex or full-duplex operation for each port. Full-duplex operation doubles port bandwidth.

The price is $299.

D-Link Systems
(949) 788-0805
www.dlink.com

LORAN TECHNOLOGIES, INC. has announced Kinnetics Network Manager, a World Wide Web-based appliance for managing heterogeneous networks.

The Vienna, Va., company's prebuilt Web server plugs in to a network and automatically creates a real-time port-to-port physical map of networked devices. It was designed to pinpoint devices causing problems such as network outages, performance degradation or traffic bottlenecks. Users can generate reports, reveal underutilized network devices and predict network behavior.

The product's cost ranges from $15,925 to $117,275.

Loran Technologies
(703) 749-5010
www.loran.com

NETWORK INTEGRITY, INC. has announced RealTime Replicator 1.5 for NT. It is data replication software for Windows NT networks.

According to the Marlboro, Mass., company, the software lets users replicate server data over LANs and WANs for disaster/fail-over protection, centralized backup and data distribution applications. File synchronization and replication can be scheduled for any time day or night, and Version 1.5 moves only the changed parts of files, even if the files are open. Bandwidth control and help wizards are also included.

Pricing is $1,495 per server.

Network Integrity
(508) 460-6670
www.netint.com

AMBICOM, INC. has announced the AMB8010 Power Saver Ethernet PC Card for Windows CE.

According to the Santa Clara, Calif., company, the card enables remote access, networking and Internet access on devices that use Microsoft Corp.'s Windows CE 2.x operating system. The credit-card-size unit snaps into a PC Card Type II slot to synchronize with corporate networks at speeds up to 10M bit/sec.

The card costs $129.

AmbiCom
(408) 727-6877
www.ambicom.com

SONY ELECTRONICS, INC. has announced the TriniCom Digital Meeting System, a videoconferencing and data collaboration peripheral for PCs or notebooks.

According to the San Jose, Calif., company, the peripheral was designed for small workgroups, can work with existing audio and camera units and connects to any 486 or higher notebook or desktop as well as any VGA display. It offers H.320- and T.120-compatible videoconferencing and cross-system application and data sharing.

Pricing ranges from $2,995 to $4,995.

Sony Electronics
(408) 432-1600
www.sony.com

CNF, INC. has unveiled The Bus, a universal port replicator that lets notebook computers attach to desktop peripherals without a docking station.

The Scottsdale, Ariz., company said users plug any brand or model of industry-standard peripheral — a monitor, keyboard, modem or mouse — in to the replicator unit and then connect the unit to the notebook through an attached Type II PC Card. It can sit vertically on the desktop or horizontally beneath the notebook.

The Bus costs $199.

CNF
(602) 348-9665
www.cnfinc.com

Insurer

CONTINUED FROM PAGE 47

Unlike dial-up modems, VPNs incorporate authentication and encryption at the firewall. Any hacker who tries to invade the Internet VPN site would find the data unreadable. The old modems had only basic password and ID protection.

"With the dial-up modems, there was always a worry that if we got hacked, the invaders could get right into our database," said Mike Lemieux, a Reliant underwriter. "Good luck to any hacker trying to guess my PIN.

"The modems were slow. We have a daily production quota, and the modem made them difficult to meet. The VPN gives me instant access to the network and rarely drops a connection, so I'm getting a lot more work done," Lemieux added.

Another Reliant underwriter, Jim Costello, also praised the improved performance. "The VPN is noticeably faster. I haven't gotten bounced off the system once since we installed it six months ago. The dial-up modems dropped connections at least once a day," he said.

Andrew Simpson, an editor at *Insurance Times*, a biweekly newspaper in Boston, said Reliant's move to a VPN is a good one for the company and its customers. "The auto insurance industry, especially in California, is extremely competitive. Anything they can do to give themselves a competitive advantage and protect customer privacy is great," Simpson said. □

E-mail

CONTINUED FROM PAGE 47

text-to-voice converter from MailCall, Inc. in Fort Lauderdale, Fla.

Being able to retrieve E-mail over the phone lets Costa maintain a virtual office, which is important because she is always on the road, she said. "I don't have to carry a laptop anymore, and I always have my cell phone," she said.

Nina Burns, CEO and president of Creative Networks, Inc., a Palo Alto, Calif.-based research firm, said phone-based retrieval technology has been around at least 10 years but hasn't always been well-integrated with electronic messaging.

PHONE MAIL PIONEER

Novell, Inc.'s GroupWise was one of the first mail applications to offer phone-access capabilities, Burns said. That capability was built in to GroupWise 4.1 and lets users log in to the system and have their E-mail messages, calendar items and task lists read back to them over the phone, Novell officials said.

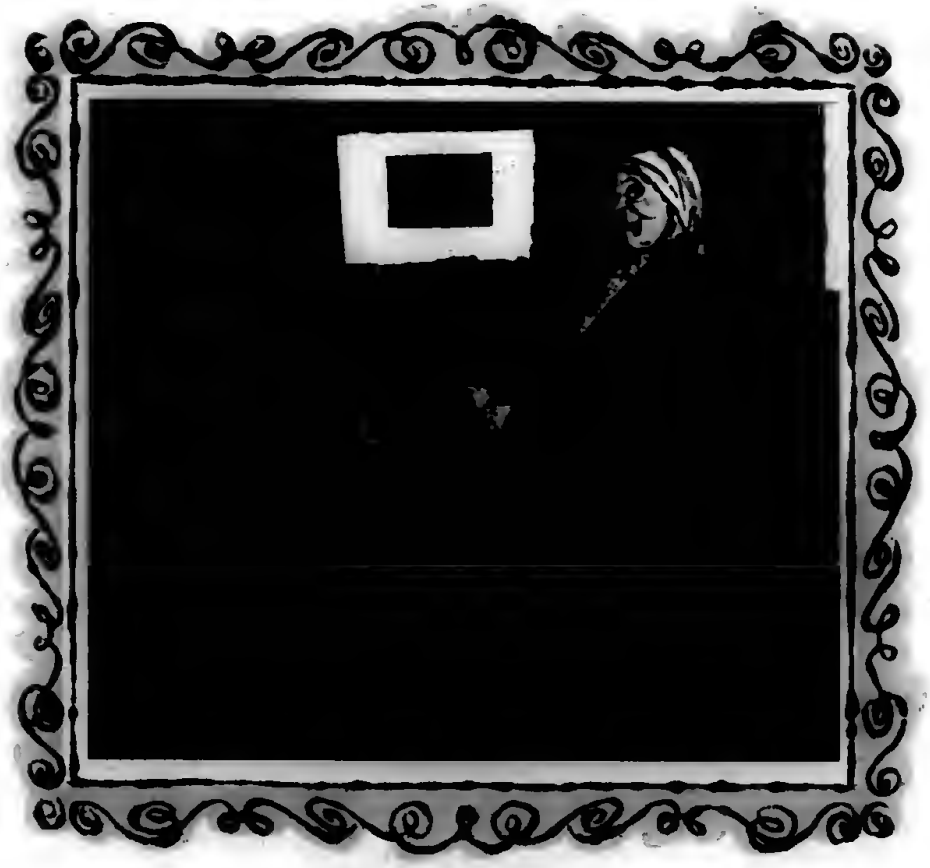
Dan Wood, a network administrator at the Milwaukee-based American Society for Quality, said his company uses GroupWise but isn't using its phone-access features. But as the company prepares to upgrade to Version 5.5, "we might take a closer look at that because we are getting more and more mobile users," Wood said. The organization has 230 employees and serves 140,000 members worldwide.

Eric Arnum, editor of the "Electronic Mail and Messaging Systems" newsletter in Forest Hills, N.Y., said unified messaging products such as CoolMail can be a lifesaver for people who don't have the time or space to plug in a laptop. But there are drawbacks.

Long-distance charges aren't cheap if you call from a car phone or cell phone, he said. And lots of E-mail messages nowadays consist of a text introduction and then an attachment, which voice-recognition systems usually can't pick up over the phone. And those products often need to be configured individually for each user, so they are tough to support across a company, he said.

Arnum said there are lots of alternatives for accessing E-mail, such as HotMail, a free Internet mail service, and cybercafes and other public terminals that you can rent cheaply. □

Mother was right.
No one said life was fair.



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AT&T outlines $1.8B in upgrades to TCI network

By Rebecca Sykes
BOSTON

AT&T CORP. HAS PROVIDED some of the technical details of its planned upgrade of Tele-Communications, Inc.'s (TCI) network, but it has yet to explain other details, such as price structure.

Basking Ridge, N.J.-based AT&T plans to expand the ongoing upgrade of TCI's traditional one-way cable television network to create an always-on, two-way, high-speed, IP-based network for telephony, digital video and data. To get there, AT&T plans to spend $1.8 billion and change the basic topology of the network, according to Dave Nagel, AT&T's chief technology officer and president of AT&T Labs in Murray Hill, N.J.

AT&T made its $48 billion bid for the Englewood, Colo.-based cable television provider late last month. The deal requires regulatory and shareholder approval. As part of the upgrade, AT&T must add to the network amplifiers that will enable traffic to travel both upstream and down and change network topology so fiber nodes serve 500 or 1,000 homes, rather than the 10,000 each currently serves, Nagel said.

The next step is to provide the two-way capability to add new services such as telephony, he said. For that, a box on the side of the house — a network interface unit — must be added, as well as an interface to the traditional telephone network and a cable modem. With those items, customers gain high-speed capability of up to 10M bit/sec. outbound and 750K bit/sec. inbound, he said.

About 59% of TCI's customers will be upgraded to two-way capability by the end of next year, and 90% will have the technology by 2000, Nagel said.

By 2000, AT&T will also begin to convert its existing circuit-based phone network to IP-based packet-switched telephony via digital set-top boxes that have yet to be manufactured, though the standard has been written, he said.

The cost to customers for getting packet-based telephony to a home will be approximately $300 to $500, not including the price of the set-top box, according to AT&T officials.

INVESTOR REASSURANCE

Industry analysts said the briefing, which wasn't AT&T's first on the subject of the TCI acquisition, seemed designed to soothe investors' fears.

"They were trying to clear the air as far as the investment they would have to make," said Frank Dzubeck, an analyst at Communications Network Architects, Inc. in Washington.

Another analyst agreed, noting that AT&T's status as a "safe" stock means its investors tend to be rather conservative.

If MCI Communications Corp., Sprint Corp. or WorldCom, Inc. were making this move, "their investors would cheer them on," said Jeffrey Kagan, an analyst at Kagan Telecom Associates in Atlanta. But AT&T investors have been jittery. "Because it's a widows-and-orphans [investment], it scares their investors," he said.

"Plumbing and infrastructure — that is the easy part," Dzubeck said. "The tough part is making this a replicable service that operates reliably, allows you to add services on a whim and basically [gives customers one] bill that says, 'You bought these 15 items.' "

"They don't have the ability to provide one bill for their existing services yet," Kagan said. □

Sykes writes for the IDG News Service in Boston.

MCI services link SNA apps, 'net

By Marc Ferranti
NEW YORK

MCI COMMUNICATIONS CORP. has launched a suite of services, dubbed NetworkMCI Enterprise Blue, designed to help mainframe users link SNA-based applications to the Internet.

There is a huge demand for services that tie SNA-based networked applications to client/server and IP environments, MCI officials said. About 39 % of all frame-relay traffic is for SNA-based applications, MCI officials said.

The services were designed to let users migrate gradually from SNA to IP or to mix them using frame relay, Asynchronous Transfer Mode backbones and the Internet.

The service comes in the following three parts:

- Integration of SNA applications with IP networks using products such as IBM's MQSeries middleware and Lotus Domino.
- Virtual private network design and implementation using networking protocols including IP, SNA and Advanced Peer-to-Peer Networking.
- Transport, using frame relay on dedicated or dial-up lines. □

Ferranti writes for the IDG News Service in New York.

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Briefs

SOFTWARE WOES

What is the worst thing that has happened to the software industry in the past two years?

Multi-vendor distributions	15.6%
Rapid change, hard to manage	9.6%
Reduced competition	6.6%
Product standards/ upgrades	6.0%
Year 2000 problems	4.8%
Higher costs	4.8%
Other	52.6%

Source: Survey of 500 U.S. companies conducted by Computerworld; 1,000 more will be polled in August

Source: IDC Consulting Group, Framingham

Import upgrade

Systra Ltd., a small New York-based developer of software for managing product importing and exporting, this month plans to announce an upgrade with new automated workflow capabilities.

Release 2.9 of Systra's Global Logistics System can be set up to create shipment invoices, check credit and handle other jobs without user intervention. The software works with Oracle Corp.'s enterprise applications and costs from $100,000 to $500,000.

Supplier data available

Trade Compass Inc. — formerly Quality Group, Inc. — in San Mateo, Calif., last week announced high-availability software that allows companies to ensure that data remains available during both planned and unplanned events.

For example, with the software, if a server goes down, [illegible] other applications without having to bring down the system. The software also comes with features such as [illegible]

Object code makes PG&E nimbler

▸ *Revamp helps IT deal with deregulation*

By Thomas Hoffman

SAN FRANCISCO utility PG&E Corp. is relying on object-oriented software to help it react quickly to changing business conditions in California's natural gas market.

APPLICATION DEVELOPMENT

Under a 1996 agreement PG&E reached with consumer groups and a set of big industrial customers, companies such as Chevron Corp. that once paid a fixed rate to move gas across PG&E's California pipeline now pay only for the section of the pipeline they use.

Gas pipelines in California are like commodity exchanges where industrial customers can "park" their gas for a few days at one rate and the utility can "lend" the customer the gas at another rate, said Scott McDonald, manager of IBIS Consulting, Inc.'a energy group in San Francisco.

The new pricing structure for gas is like stock that is bought and sold on margin in the stock market, McDonald said. Natural gas in California can now be parked on a utility's pipeline until industry pricing improves, making customers willing to move it at the more attractive price.

The utility faces increasing competition from [illegible] ing natural ga deregulation

To help ready itself for increased competition following the gas accord and ongoing industry deregulation, PG&E recently decided to rebuild its gas information systems. The object-oriented approach helped PG&E during a crucial period. It had just three

PG&E, page 54

Desktops are not immune to year 2000

By David Orenstein

IF YOUR year 2000 work is nearly complete on your mainframes, congratulations. You may now begin worrying about how to check and fix the date-sensitive data in thousands of desktop spreadsheets and databases across the company.

The year 2000 risk that critical desktop spreadsheets and databases face has been underplayed by major office software vendors until recently, said Bruce Hartsough, senior vice president of end-user computing at San Francisco bank Wells Fargo & Co.

YEAR 2000

"Every spreadsheet is potentially relevant to a customer until proved otherwise," said Hartsough, whose bank has more than 20,000 PCs.

New York-based financial services giant The Equitable Cos. also has begun to root out possible millennium bugs on its thousands of desktops. Most mission-critical data resides on mainframes, said year 2000 project officer Bill Born, but users often manipulate and analyze much of that information in applications that may not handle the data compliantly.

Thus, a financial analyst's

Desktops, page 54

Chicago cops contain Bulls victory mayhem with mapping software

By Stewart Deck

THE SIXTH TIME Michael Jordan and the Chicago Bulls won the National Basketball Association championship was far different from the first time. After the first title in 1991, the Chicago street celebrations turned into dangerous riots with cars burned, windows smashed and onlookers bloodied.

This year, the Chicago Police Department tied mapping technology to incoming 911 emergency calls to pinpoint developing danger spots and get police on the scene fast enough to control the celebrants.

Data from calls to 911 about mobs forming, fires set and shots fired were pulled into a MapInfo Corp. application, which geographically coded the information and stored it on an Oracle Corp. server. Police officials could then view colored maps on large screens that showed the hot spots in real time so they could move in the forces needed to deal with the troubles.

"We are able to identify problems sooner and respond more quickly to them now," said Jonathan Lewin, a sergeant at the police department. "It gives

Mapping software, page 54

Police tracked potential trouble spots during Chicago's NBA finals victory celebration to reduce the number of problems

Business application rollouts still difficult

By Craig Stedman

RAPID DEPLOYMENT schemes. Bundled systems. Vertical tailoring of applications.

SAP AG and other packaged application vendors are trying all of the above to reduce the complexity of installing their software. And the moves are helping streamline some projects. But a half-dozen users said putting applications in place is still no picnic.

Several factors make deploying business applications such as SAP's R/3 software an inherently thorny undertaking, the users said (see box, page 56).

For example, Henry Cadmus, vice president of operations at Bruno Magli USA in Karlstadt, N.J., recently spent more than

App rollouts, page 56

Mapping software

CONTINUED FROM PAGE 53

us a better assessment of crime conditions, which allows us to develop strategies to respond to them."

David Sonnen, an analyst at International Data Corp. in Blaine, Wash., said that type of mapping data is becoming more mainstream because the latest object-friendly database releases and tools from vendors including Oracle, Informix Corp. and IBM now can more easily store and manage geographic and other spatial data.

For example, anything from a map to a fingerprint now can be represented as a data type within a database.

When databases can handle spatial data, users can apply all the database design and analysis tricks they know.

"The ability to use complex data types — including spatial — is really changing the way people support their business practices," Sonnen said.

The Baltimore County Police Department also uses statistical mapping technology to identify crime patterns. By comparing types of crimes and neighborhoods, the department is able to key in on trends and make strategic responses.

MapInfo software helped police identify trouble spots during celebrations after the Chicago Bulls became NBA champions. Here, color-coded triangles show the rate of different crimes in various neighborhoods.

NO MORE PUSH PINS

"Before this, we used acetates, static maps and push pins. It has made us more effective," said Carl Koprowicz, statistical supervisor at the Baltimore County department.

Although sales of mapping software should grow about 10% per year during the next five years, it is still a hard sell outside its traditional base of users in areas such as emergency dispatch, agriculture, direct marketing and land management, said Sharon Tan, an analyst at Dataquest in San Jose, Calif.

Harlem Furniture, Inc., Chicago's second-largest furniture retailer, uses mapping software for cluster analysis of sales data in its Oracle database of 750,000 customers and prospects.

"The dynamic of who has bought leather furniture is different from who has bought a country dining room," said Michael Lombardo, vice president of marketing.

"This allows us to digitally map them, and . . . we can then select our [promotional] distribution and direct mail based on [their] past performance," Lombardo said. □

Desktops not immune

CONTINUED FROM PAGE 53

assumptions about the profitability of a mall owned by an Equitable pension fund could depend on the PC understanding that the mortgage comes due in the early 21st century, not the early 20th.

BC Rail, a railroad in British Columbia, has already turned up year 2000 bugs in 14% of its desktop applications, said Judy Nielsen, senior product specialist at the Vancouver-based passenger and freight carrier.

With as many as 10 spreadsheets, databases or other user-created applications per user, companies may find denial a tempting mind-set, said analyst Simon Levin at Stamford, Conn.-based Gartner Group, Inc. Most companies vastly underestimate the extent of the potential problem, he said, and "we've had people who just avoid the issue completely."

To manage the problem, companies should inventory desktops and applications and then triage on the basis of risk, Levin said. Most applications by far will be unimportant or won't have problems, he said.

The other part of managing the desktop year 2000 search is to ask end users to fix their own applications. Fixes need to be done manually, but an emerging class of tools can flag problem areas and guide end users to them, Levin said.

In many cases, just dates and formulas — which users enter anyhow — need to be fixed.

Born said Equitable asks users who believe their spreadsheets and databases to be at high risk to test them on 11 different system dates including Dec. 31, 1999; Jan. 3, 2000; the oft-forgotten Feb. 29, 2000, leap year date; and critical dates such as the end of each fiscal quarter.

Hartsough said users generally understand the necessity, but they worry about having the time to find, fix and test the dates.

LATE TO THE PARTY

Commercial tools to address year 2000 issues on the desktop have come to market only in the past 10 months, Levin said. BC Rail and Wells Fargo are using Viasoft, Inc.'s On-Mark 2000 Assess. Born said Equitable is evaluating several tools but hasn't settled on any. It used Computer Associates, Inc.'s CA-Unicenter to inventory its PCs.

Vendors such as Microsoft Corp. are steering companies to third-party tools for year 2000 remediation work, much to some companies' chagrin.

Equitable's next step after taking its inventory was to ask vendors which products are compliant and what to do if they aren't.

Bell Atlantic Corp. spokesman Jim Smith said the telephone company, which has 80,000 PCs, expects its vendors to help it achieve year 2000 compliance as part of their product support service. □

PG&E nimbler with objects

CONTINUED FROM PAGE 53

and a half months to modify systems that support customer contracts and meet a March deadline imposed by the California Public Utilities Commission said Judi Mosley, manager of the utility's gas accord implementation.

PG&E had been working since August 1996 to rebuild its information systems with help from IBIS Consulting, which has worked with the company since 1994.

IBIS used object-oriented tools from Oakland, Calif.-based Forte Software, Inc. and Actuate Software Corp. in San Mateo, Calif., to help PG&E introduce new products and services quickly. For example, PG&E's gas information system "had to become a lot more sophisticated" to keep track of gas movement from Northern to Southern California, Mosley said.

Utilities that react quickly to the new way of doing things will gain market share

To accommodate those needs, IBIS recently used the object tools to develop a business-to-business dial-in transaction system to help PG&E match gas supplies to usage as part of the new gas information system.

Mosley said a small percentage of transactions are handled via the World Wide Web.

Some utilities such as PG&E "see the changes coming and move quickly to change the front office," said Mark Shirman, an analyst at Cambridge Technology Partners in Cambridge, Mass. The utilities that get products and services to market faster in the deregulated industry "will get market share and the others will be left behind," Shirman said. □

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App rollouts

CONTINUED FROM PAGE 53

30 straight hours trying to lock down the footwear maker's R/3 configuration and put the software on a production server.

He said the process "is exciting because of all the new functionality" R/3 will offer, such as improved forecasting and automated order allocation. But the software "is like night and day" compared with Bruno Magli's 12-year-old homegrown minicomputer applications, Cadmus said.

Bruno Magli also is one of the first users of an R/3 release for apparel and footwear companies. "One of the challenges is that it's brand-spanking-new," said Cadmus, whose voice-mail greeting notes the R/3 work and warns that he "will get back to you if ever I can."

Bell Canada, which is replacing its financial systems with R/3, is using SAP's AcceleratedSAP rapid deployment methodology. But the Montreal-based telephone company decided against installing a new telecommunications-oriented R/3 release because it didn't want to be a software pioneer.

And getting the several thousand employees who will use R/3 ready for the new software "is a tall order," said Frank Barfuss, business-side R/3 project manager at Bell Canada. The software makes altering business processes inevitable, he added. "This changes the way we do things dramatically, and the number of people impacted is tremendous."

Big application rollouts that used to take at least four years can often be done in three or less now, said Jim Shepherd, an analyst at AMR Research, Inc. in Boston. Many midsize firms can install packaged software in six to 12 months.

NOT A SIMPLE JOB

But configuring applications to fit a specific company remains "incredibly intense," Shepherd said. "It's never going to be simple to replace all of your business systems."

PPG Industries, Inc., a $7.4 billion maker of glass and other products, isn't doing any customization of Oracle Corp.'s human resources and payroll software. But setting up the software to match each of its 88 sites is a big job, said Lyle Smith, director of global human resources information systems at Pittsburgh-based PPG.

LIVE THROUGH THIS

Factors that complicate enterprise application installations include:

- **The need to change ways of doing business**
- **Shortage of consulting help**
- **New and unproven vertical applications**
- **Lack of involvement by business users**
- **Different setup needs from site to site**

"The good news is that it's very flexible and configurable," Smith said. "But the bad news is that it's very flexible and configurable." And experienced consultants are hard to find, he added.

For Church & Dwight Co., a baking soda maker in Princeton, N.J., a big challenge was getting all business units to devote users to an R/3 project on a regular basis. Some units "sent whoever was available at the time" to project meetings and weren't ready to handle R/3 when it went live in April, said Mike Panesis, director of MIS at Church & Dwight. That slowed order processing while his staff scrambled to "make sure people didn't fall too far behind," he said. □

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Servers & PCs

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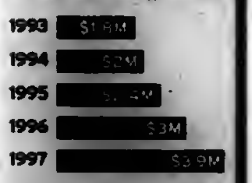
Briefs

PRINTER SALES SOAR

Printer sales more than doubled from 1993 to 1997.



Source: Computer Electronics Manufacturers Association, part of the Electronic Industries Alliance in Arlington, Va.

Notebooks finally get the pre-boot

▸ *Tool can tweak notebooks as they start*

By Kim Girard

IT'S THE SAME old story — but with a new twist of hope. Users demanding the same network manageability features on notebooks that they expect on the desktop are starting to see the tide turn.

For example, modem maker 3Com Corp. and software and support vendor SystemSoft Corp. recently demonstrated the industry's first pre-boot management capabilities for notebooks. The function is designed so support technicians can take control of a user's machine to upgrade applications, check for viruses and install new software remotely.

REMOTE SUPPORT

Unlike other software management offerings, pre-boot management will enable support technicians to fix a system that won't boot — by letting the worker replace corrupt system files or reset incorrect BIOS settings.

Notebook PC makers are expected to offer the SystemSoft software on notebooks by next year. Several vendors, including Compaq Computer Corp. and Toshiba America Systems, Inc., are working on similar proprietary technology for their systems, said Gerry Purdy, president of Mobile Insights, a consultancy in Mountain View, Calif.

The beauty of the pre-boot function is that no software is required on the client end and the help desk worker can take over the machine before the operating system boots up, Purdy said. All that is needed is a BIOS extension and a PC Card.

That could help companies control spending on network administration for notebook users, which costs up to 60% more than spending for desktop counterparts, according to Gartner Group, Inc. in Stamford, Conn. That cost is an increasing concern. And the number of notebook users continues to climb, from 15% of all PCs today to 50% of all systems many firms will buy in the next year, according to International Data Corp. in Framingham, Mass.

What pre-boot options bring to notebook PC management:

- Make possible remote installation of operating systems and applications
- Let IS manage tasks on PCs that aren't connected to a network
- Simplify upgrades on client software

"Whatever they can do to the laptops to help manageability will be a great help," said Rick Ewing, technical support manager at American Building Maintenance Industries, Inc. in San Francisco. "There's almost nothing now."

Notebooks, page 59

REVIEW▸ *CrossPad*

IBM product gets it in writing

By David Essex

ALTHOUGH PEN-BASED computers have found some success on factory floors and delivery routes, they haven't made it very far into boardrooms (3Com Corp.'s PalmPilot notwithstanding).

Laughably bad handwriting recognition, such as that from Apple Computer, Inc.'s discontinued Newton MessagePad series, hasn't helped.

Now comes the CrossPad, a joint venture of IBM and A. T. Cross Co. (the Cross pen people) that combines a low price with manageably low ambitions.

The $399 CrossPad is basically a yellow legal pad with a slim, 2.2-pound computer underneath for capturing ink, transferring it to a PC running Windows 95, 98 or NT 4.0 and optionally converting it to text.

Hidden inside a plump Cross

CrossPad, page 59

PRODUCT REVIEW

▸ *CrossPad*

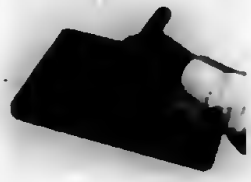
OVERALL GRADE: B

CROSS PEN COMPUTING GROUP
Lincoln, R.I.
(800) 320-9660
www.cross-pcg.com

Price: $399

Pros: Good tools for structured notes, easy setup, inexpensive

Cons: Poor handwriting recognition, not useful for many people



Fingerprint security promises convenience

▸ *Cost, installation issues slow user inroads*

By April Jacobs

FINGERPRINTS MAY PROVIDE users with a more secure way to log on to their computer systems. But cost, reliability and installation issues may keep the technology from becoming mainstream any time soon.

That's what users and analysts have to say, after San Jose, Calif.-based Samsung Electro Mechanics and Houston-based Compaq Computer Corp. each recently introduced systems with fingerprint technology for PCs.

Samsung Fingerprint ID Keyboard:

- Delivery expected later this year
- Pricing between $60 and $70
- Support for Universal Serial Bus

Compaq's device attaches to a keyboard or monitor and plugs in to a PC's standard Peripheral Component Interconnect slot; Samsung introduced a Universal Serial Bus-based keyboard with a fingerprint identification device attached. Both systems will be available later this year for less than $100.

Both companies are targeting the new systems for environments where security is important, such as research and development, finance and manufacturing.

And although passwords already provide a level of security at most companies, users can forget them or they can be stolen and used without permission.

Fingerprints, on the other hand, provide user authentication — something that passwords don't. Using fingerprints also can prevent needless calls to the help desk, because they can't be forgotten.

Those arguments are good ones, said Dave Geiver, senior technology officer at First Premier Bank in Sioux Falls, S.D. But with the exception of niche areas where security issues would make the steep price tag worth it, bankers are likely to go

Fingerprint, page 59

Servers & PCs

Large Systems • Workstations • Portable Computing

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Fingerprint, page 59

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www.unisys.com/ent

AS/400 online service

By James Niccolai

IBM HAS LAUNCHED an online information service that it says provides up-to-date technical information for users of its AS/400 business computing system.

The online service provides up-to-date and comprehensive information about IBM's AS/400 system in a way that can be understood by nontechnical readers, according to IBM.

Content for the site was adapted from a print book, *Exploring IBM AS/400 Computers*, published by Maximum Press in Gulf Breeze, Fla.

The *AS/400 Online Encyclopedia* can be found on the World Wide Web at *www.as400.ibm.com/encyclopedia/*. □

Niccolai writes for the IDG News Service in San Francisco.

Fingerprint technology

CONTINUED FROM PAGE 57

with the more tried-and-true password system, he said.

"There is a lot of hesitation when it comes to investing in technology," Geiver said. Until a technology is proved roadworthy, banks tend to err on the side of caution, he said. Installation and interoperability issues are another stumbling block, he said.

For example, Geiver said most security measures are somehow tied to the mainframe — so any new technology would also have to work with those systems.

"There is already a lot of investment in the structure that has been set up in terms of authentication and profiles," he said.

Analysts also predicted a niche market for the technology, at least until it comes as a standard component in PC hardware and the price tag isn't an issue.

"The whole area of biometric authentication holds a lot of promise, but basically, to make this ubiquitous, it's going to have to be free," said Chris Goodhue, an analyst at Stamford, Conn.-based Gartner Group, Inc.

"But, things that are introduced at these price points invariably come down considerably and may end up being built into the keyboard or mouse," he said. □

Notebooks get the pre-boot

CONTINUED FROM PAGE 57

About 150 of the company's 2,000 users work on Toshiba notebooks, and Ewing said upgrades are difficult to track because of their short life cycles.

"The hardware changes so quickly that we wind up with so many flavors [of notebooks] throughout the company," Ewing said. "We have to track the drivers and the CDs, etc."

Not everyone sees the necessity of pre-boot management options.

Although remote-administration tools won't help Ewing track the updates to his users' many notebooks, those tools can make it easier to install them. His company is looking at docking stations with so-called wake-on-LAN technology that lets the information systems department wake up a system to remotely perform an upgrade or task when the machine is docked.

But not everyone sees the necessity of pre-boot management options.

"I'm not sure [pre-boot management] would buy us a whole lot," said Joe Federer, vice president of IS at HBO & Co. Healthcare in Atlanta, which uses XcelleNet, Inc.'s RemoteWare product to download applications across the network. The XcelleNet software, which runs after the operating system loads, detects viruses, downloads applications and synchronizes files.

The company replaces its hardware every two years, and Federer said maintenance issues typically are software-related and occur after the user's operating system kicks in. □

REVIEW▶ *CrossPad*

IBM gets it in writing

CONTINUED FROM PAGE 57

ballpoint pen is a tiny radio that transmits its location to the CrossPad. Six oval depressions in the plastic, plus a small LCD screen, provide control functions that can't be indicated on the physical page, such as changing pages, navigating through a menu and identifying circled words as keywords.

You must remember to use those controls to tell the CrossPad what it can't know you are doing, such as flipping back to make notes on a prior page. CrossPad data is useless until you transfer it to the IBM Ink Manager software on the PC. There, this package runs the whole show: data transfer, management of captured ink files, document management and handwriting recognition.

For the latter, you hand-write several prescribed writing samples from the tutorial. Then Ink Manager spends an hour or more trying to learn your writing style. Next, you approve, correct or reject the recognized text by comparing the on-screen results with your original.

On my 200-MHz Pentium Pro-based PC, Ink Manager took about 35 minutes to process one 60-line training set. In subsequent use, recognition took just a few seconds. Unfortunately, Ink Manager never could recognize more than 80% of my writing, which is just a bit sloppier than average, and 50% was typical. That left me with so many errors to correct that it was easier to type directly in to Ink Manager or avoid the conversion altogether.

Regardless, you can do a lot with the CrossPad without ever converting your notes to ASCII text. Captured ink — not recognized handwriting — is the CrossPad's primary medium. For example, notes often contain diagrams and annotations, and it usually is more important to see these notes as reminders than to use their actual text.

To bring a logical structure to your notes, Ink Manager lets you group related notes into notebooks, assign bookmarks for quick navigation, and mark keywords. You can cut and paste sections of ink from one page or notebook to another and highlight parts of pages for recognition. You can navigate through your notebooks according to page number, bookmark, keyword, upload or date.

I found the CrossPad easy to set up, except for installing the four AAA batteries in their plastic compartment, which I had to force open. The unit's controls all work as promised, and creating and processing notes is fairly intuitive, although the penpoint seemed to drag on the page, requiring extra force that tired my hand. Data transfer was unpredictable: Sometimes it wouldn't start, or it would hang partway through. The culprit seems to be the small plastic connector on the CrossPad end of the cable. Mine didn't sit snugly in position.

I also had trouble finding the location of recently imported ink notes and keeping the various uploads in order. The otherwise good documentation doesn't make these issues clear.

The CrossPad might be useful to anyone who regularly takes unstructured notes in which images convey more information than words and who needs to enter the information into a PC program. People involved in real estate, engineering and field sciences are likely users. But I question the usefulness of storing unconverted notes on the PC — why not just keep paper copies? And if your notes tend to be brief, with lots of phone numbers and to-do lists, buy a personal digital assistant instead. □

Essex, former director of reviews at Byte Magazine, *is a freelance writer in Antrim, N.H. He can be reached at david_essex@conknet.com.*

NEW PRODUCTS

PRECISION NAVIGATION, INC. has announced the Palm Navigator, a hardware module that turns a PalmPilot from 3Com Corp. into a map navigation system.

According to the Mountain View, Calif., company, the module plugs in to the bottom of the PalmPilot like a modem. It has a magnetic compass and includes software that streamlines and organizes Internet map downloads.

It costs $39.95.

Precision Navigation
(650) 962-8777
www.precisionnav.com

TATUNG SCIENCE & TECHNOLOGY, INC. has announced Compstation U2360, a 64-bit desktop workstation that has dual 360-MHz UltraSPARC-II processors.

According to the Milpitas, Calif., company, the Sbus-based workstation's symmetrical multiprocessing distributes the operating system and applications across multiple processors for faster performance. Standard configurations include 128M bytes of RAM, a 4G-byte hard drive, the Solaris 2.6 operating system from Sun Microsystems, Inc., four Sbus slots and a 20-in. color monitor.

Pricing for the standard configuration of Compstation U2360 starts at $25,230.

Tatung Science & Technology
(800) 659-5902
www.tati.com

WYSE TECHNOLOGY, INC. has announced the Winterm 2000 Series, Windows-based thin client computers for point-of-sale, hospitality and multimedia applications.

According to the San Jose, Calif.-based company, the terminals are based on the Independent Computing Architecture and provide access to Windows, Java, VT220, VT100, VT52, DOS and browser-based applications. They feature integrated audio output and optional embedded 3270/5250 terminal emulation for mainframe access.

The 2315SE works with existing VGA monitors, and the 2515SE and 2715SE have 14- or 15-in. color displays.

Pricing for the Winterm 2000 Series family ranges from $349 to $2,500.

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Video sabotage?
Videoconferencing may cause problems for virtual teams
Page 63

Managing

The Eternal Project

Whew! You've installed that data warehouse. Time to celebrate? No way! There's hard work ahead of you

MARK BARLOW

Metropolitan Life Insurance's Kevin Perez finds it good practice to not force-feed his users with new data warehousing tools

Hallelujah!

Your data warehouse is finally complete, and you've just rolled it out to a waiting and eager user community.

But don't uncork the champagne yet. Some challenges — some may even say the most difficult ones — remain.

Yes, there's cause for real celebration, but it's also time to take realistic stock of the major — and long-term — responsibilities you've undertaken that now are kicking in.

True, if you have a problem after implementation, often "it's because you made a mistake a long time ago," says Wayne Eckerson, vice president of technology services at The Data Warehousing Institute in Boston. You didn't involve your users enough. You failed to secure a high-level sponsor and so on. But many of the challenges that arise are either unavoidable or, ironically enough, the result of a job well-done.

Here's how information technology managers and consultants advise how to deal with the surprising — and inevitable — fact that a warehouse is never, ever really finished.

CHALLENGE NO. 1: YOUR BUSINESS CHANGES

"Your business will change. Count on that," declares Jeff Gentry, a systems consultant at the Computer Systems Authority in Dallas. "Which means, of course, that your warehouse must change with it."

After all, points out Douglas Hackney, a data warehousing consultant and president of Enterprise Group Ltd., a Hudson, Wis.-based consulting firm, the whole point of a warehouse is to provide a bridge between your company's urgent, daily information needs and the data stores that are immediately and readily available. "And both things change every day," he says.

Early warning signs tend to revolve around a growing backlog of requests for modifications. The solution? Implement processes to handle those requests. "IT people tend to be technology- and data-driven, yet

Eternal project, page 62

The Eternal Project

CONTINUED FROM PAGE 61

most of the work in maintaining a viable warehouse is process-driven," Hackney says. "The question after implementation becomes one of accommodating the request for ongoing and necessary modifications."

And be prepared for the challenges that arise from success. If your users begin to flood you with additional demands, it might just be because you've done your job exceedingly well. The best way to handle that? Figure it's going to happen — and plan accordingly, says Don Stoller, director of decision services at Owens & Minor, Inc, in Glen Allen, Va., a wholesale distributor of medical supplies.

Stoller knows whereof he speaks. The first phase of an enterprisewide data warehouse project at Owens & Minor was finished last year. Sales professionals for the first time were able to access all information on customers and suppliers — from initial contact to final invoice. Although initial plans were to finish the sales piece and move quickly on to other functional areas — marketing, finance and distribution — all that has changed.

"We simply didn't anticipate the user enthusiasm," says Stoller, who won a Data Warehousing Institute "best practices" award for the project. His decision: Scale back new development of other subject areas in order to keep up with user-suggested enhancements to the warehouse.

Why do that rather than put enhancements on hold until the companywide project was complete? "We wanted to maintain the obvious momentum that has come from user enthusiasm and excitement," Stoller says.

To avoid cries of outrage from other subject areas panting for their own data warehouses, Stoller has set up several steering committees to help set priorities. He meets with his immediate staff, which includes technologists and business users, on a weekly basis, and every other month there's a senior management meeting to assess progress and decide on larger scheduling issues.

CHALLENGE NO. 2: THE TECHNOLOGY CHANGES

Technology advances that allow for greater productivity, efficiency and cost savings might force necessary changes.

"We're in a constant redesign mode," says Larry Smyth, senior manager at WarehouseMCI, a major warehouse project for MCI Communications, Inc. that lets the telecommunications giant track customer purchases, usage patterns and vendor-switching tendencies. Designed four years ago, WarehouseMCI went into production in 1996.

Now, Smyth is in the middle of a massive restructuring of the technology and the underlying processes. And that is for a project viewed as a major success both internally at MCI — where it has enabled a 20% increase in sales leads — and by customers, who benefit from targeted cost/benefit analyses of their telecommunications usage.

"You anticipate that this [redesign] might eventually occur, but you really don't know the full extent of it," Smyth says. "New technologies, new tools are now mature that weren't even available a year ago. It's necessary to revisit how you've done things."

CHALLENGE NO. 3: KEEPING YOUR IT WORKERS INTERESTED

The need for ongoing maintenance leads to a significant challenge: to keep IT workers themselves interested in the project.

"When you first go into development, your people are understandably excited about the new tools and technologies they're working with," Stoller says. "But that changes once you get into maintenance mode."

Hackney agrees. "The best and the brightest want to build your warehouse. [But] the best and brightest do not necessarily want to maintain it," he says.

Smyth addresses that by continually reassigning jobs and cross-training workers from different IT functions. "You must constantly challenge your people to learn new things," he says.

CHALLENGE NO. 4: EASY-TO-USE TOOLS AREN'T, USERS COMPLAIN

"I'm afraid users have a different perspective on what is easy to use," says Benjamin Taub, a project manager and senior warehouse architect at Dataspace, Inc., an Ann Arbor, Mich., consulting firm that specializes in data warehouse development and design. He recalls one system he helped build — a multimillion-dollar, multiyear billing project for a utility — that users "didn't want to touch" when completed.

That aversion was traced to a combination of insufficient hands-on training caused by pressure to roll out the warehouse on a schedule, the absence of familiar monthly paper reports that users had traditionally depended on and the lack of user familiarity with the concept of a point-and-click interface and of constructing effective queries.

It's important that IT workers not overestimate a software tool's ease of use from a user perspective, Taub says. But that's easier said than done. Because technology workers use those tools daily, they lose track of how strange they might be to the uninitiated.

"There's a tendency to push the most productive, sexiest, [most] powerful tools the market offers down a user's throat," Eckerson agrees. You might want to give them, instead, a version of the data that they're familiar with. "For IT people, that can be painful because it means taking a step back," he says. It means that if users have been used to reading monthly paper reports, you should keep giving them the monthly reports. Then, he says, you provide them with a painless and guided "migration path" to the new, automated — and vastly more efficient — way of accessing key data.

"In other words, if you don't give them a bridge to get from where they're at to where you want them to go, they may never cross over to the new world," Eckerson says.

Kevin Perez is doing exactly that. As manager in consultant operations at Metropolitan Life Insurance Co.'s Mount Prospect, Ill., regional office, he knows his users are sophisticated technically. Still, most won't be given the tools to do ad hoc querying.

Only account specialists with specific needs will need to do that; everyone else will be provided with reports. The idea, he points out, isn't to give everyone a shovel to sift through the mountains of customer data being assembled but to provide relevant information much more efficiently and cost effectively.

CHALLENGE NO. 5: DIRTY OR OUT-OF-SYNC DATA

It's the worst scenario of all — even worse than the Query From Hell. Your users are flocking to the warehouse, yet the answers they get to their queries don't make sense to them. They lose confidence, they get suspicious, and the warehouse dies.

"When a question of credibility arises, you are in big trouble," says Richard Kachur, a consultant at NewThink, Inc., a data warehousing and Internet consulting firm in Calgary, Alberta.

The data itself might be fine. The problem might be poor data definitions or out-of-sync refreshing of the warehouse data from disparate systems. That can turn into a political nightmare if the warehouse is populated with data from departmental systems.

"If your business sponsors are not at the right organizational level, and an enterprise-level process for data refreshment is not in place, then you've got political, not technical, problems to sort out," Gentry says.

It's a serious problem. What do you do if you have potentially corrupt data in a finished warehouse? You do a thorough, exhausting and painful audit.

MORE ONLINE

For a Real Audio interview with data warehousing consultant Douglas Hackney, visit Computerworld online.

www.computerworld.com/more

"You must go back to the source system, examine not only the original data, but see how it is being pushed through the system and when and how it is refreshed," Kachur says. He adds that this is one area that shouldn't surprise IT managers. "From day one, people should be looking at data integrity and data movement. But they typically don't." □

LaPlante is a freelance writer in Woodside, Calif.

What You Heard Is Not What I Said

Videoconferencing may sabotage communication for virtual teams

By Kathleen Melymuka

The first videoconference call with your new virtual teammates is a flop. "We really didn't click as a group," you think. "And anyway, some of those folks are not the sharpest knives on the cutting board; I'm probably going to have to carry them. And I'm not sure I trust that one guy. Some team."

If you've ever felt that way after a videoconference, you aren't alone. According to ongoing research at Xerox Palo Alto Research Center (PARC) in California, videoconferencing regularly sabotages attempts at remote teamwork. Vague feelings of unease, mistrust and lack of confidence in others' abilities are hard-wired into the technology, says Brigitte Jordan, a Xerox PARC corporate anthropologist.

"Again and again, people who have worked that way tend to trust the other person less, tend to think he is less competent and very often have a feeling that something is not quite right," she says, citing several studies on the phenomenon. And with more IT projects being managed and worked on remotely, with input and expertise from all over the world, those tendencies can spell trouble.

Jordan, with Karen Ruhleder, an assistant professor of information science at the University of Illinois, Urbana-Champaign, has been researching for more than two years how remote communication technology affects communication.

Human interaction is largely based on a turn-taking system, Jordan explains. When John talks, Susan watches, says, "Uh-huh," and nods so that John knows she gets what he's saying. Then it's her turn. If he looks confused or says, "Huh?" that's a trouble flag. Susan knows immediately that there's a problem, and she can correct it on the spot.

"We all know how to do it perfectly face-to-face," Jordan says. "We do it without knowing we do it."

To prove it, she suggests, try to sit on your hands and not make eye contact with speakers in an animated conversation. "It will have a weird effect," she says.

Videoconferencing has a similar effect; it takes all the cues away and displaces the feedback. "Everybody thinks that video helps," Jordan says, "but video makes it worse." Using videoconferencing, you think you can look in the remote parties' eyes, but you can't, she explains, because the resolution is so poor you can't even see their eyes. "You can't tell where they're looking," she says. "You can't tell if they're paying attention."

But that isn't all. When Jordan and Ruhleder videotaped conferences between a team of West Coast software developers and East Coast users, they found that a one-second transmission delay sabotaged feedback and threw a monkey wrench into the turn-taking system.

The delay happens because of the way video is packaged for transmission and how voice is synchronized with video. Jordan says a one-second delay is average.

Is one second a big deal? Well, actually, yes. Tom Nolle, president of CIMI Corp., a telecommunications consulting firm in Voorhees, N.J., says his research has shown that even a 0.2-second delay is enough to interfere with group dynamics. "Things come in sequence but systemically displaced," Jordan explains. "And this is what generates that vague discomfort."

In fact, because of the delay, people in different places hear the conversation differently.

If you've been on a virtual team, you've probably experienced this in videoconference calls: You talk and then you pause, but the expected response doesn't come. So you say something else and find yourself "stepping on" — talking simultaneously with — another person. You stop. More silence. Then you start again, and you step on someone else. You may ask a question, pause, ask another and hear the answer to the first question, mistaking it for the answer to the second.

Nolle says participants interpret all this hesitancy as lack of support for the speaker, making the group dynamic increasingly negative and feeding the idea that the other participants are incompetent, untrustworthy or just not quite right.

Because there are no eye-contact cues or trouble flags, it's hard to tell what's wrong. "Everybody knows there's a problem, but even techies don't get what it is," Jordan says. "There's a vague, 'I don't like it.' "

Jordan says virtual teams need to be aware of those problems and then use videoconference calls only when they will help communication. For example, don't use videoconferencing for initial explorations of topics, brainstorming or any situation in which there will be a fast series of ideas or questions.

Knowing your virtual teammates and understanding the delay effect can make the difference. "People here tend to know each other, and they get used to it. People chuckle about it when they step on each other," says Mark Armentrout, manager of upstream information technology at Atlantic Richfield Co. in Plano, Texas.

"But it should be a company policy not to expose people to people remotely until they meet face-to-face," Jordan says. □

Melymuka is Computerworld's senior editor, management.

HOW VIDEOCONFERENCING CAN GO WRONG

Two perspectives on an actual videoconference, provided by Brigitte Jordan at Xerox PARC in California (names have been changed):

What Ann hears (and what she says)

Bill: We could all sit around the table and look at it. ["I see"] But in the future, I think that's [pause] exactly why . . .

What Bill says (and what he hears)

Bill: We could all sit around the table and look at it. But in the future I think ["I see"] that's [pause] exactly why . . .

Ann believes she has been helpful by confirming an understanding of Bill's arrangements for an upcoming meeting. She has no idea why Bill might pause in the middle of a sentence. But Bill hears Ann's "I see" at a conversationally inappropriate place, and that breaks his stride, so he pauses before continuing.

— Kathleen Melymuka

For most of this decade, information technology has been a Very Good Thing. Soon, it's going to be as popular as air pollution.

THERE'S A BACKLASH COMING — AND IS WILL BE CAUGHT IN IT

IT has been a VGT for investors who got in early on tech stocks; kids who love games, surfing and chat rooms; and journalists, who have something exciting to write about. For businesses, it's been the enabler of innovation everywhere.

What goes up must come down. The pendulum swings. There's a very big backlash coming against IT in general. As the visible representative of technology as a Very Good Thing, IS will be caught in the headlights of the oncoming shame-and-blame train, even though most of the backlash will reflect vendors' actions and inactions.

Here are just some of the backlash generators:

1. **The ever-increasing complexity of what are advertised as ever-more-simple tools.** Every promise of plug and play, user-friendly, better, faster, kinder, and gentler in the world of Windows and Intel has been a con. Installing a printer, CD-ROM or LAN has, on average, an 80% chance of success. When simple E-mail attachments confuse and confound, networks and PCs become a source of frustration, not communication. When PowerPoint files can't be transferred from a PC that uses one version to a PC that uses another, and when the two leading browsers can't handle frames and multimedia developed with standard software tools, it's easier to go back to faxing.

2. **The indifference of many IT vendors, online services and software providers to their customers once the product is sold.** IT goods and services are inherently complex and require top-rate support and service as part of the promise, not a reluctant add-on. As anyone who has to wait on a vendor's 800 line for hours knows, more and more "help" lines are the opposite. Warranties are too often paper equivocations and fine print. The industry as a whole seems to have no sense of its obligation to its customers.

3. **The widespread sense of danger in venturing into the online world.** Security risks, threats from viruses, privacy invasion, lack of consumer protection laws and the many problems associated with chat rooms and pornography may be far less real than many Internet users believe. That isn't the point. It's what they believe that matters.

4. **Breakdowns in service: The more we all depend on IT, the more consequential any breakdown will be — and is.** Within the past few weeks, a satellite swinging out of orbit silenced pagers and cellular phones. Even if 99% of all companies solve their year 2000 problems (year 2000 is a giant backlash generator in itself) there'll be a lot more impact than just that. And it's more likely that 69%, rather than 99%, will solve the problem.

5. **Rapacity:** Telcos, PC makers, Internet service providers, cable companies and electronic-commerce providers are in search of the pot of IPO and mergers and acquisitions gold at the end of the IT rainbow. This is a greedy industry that boasts of its greed.

The coming IT backlash will be very similar to the environmentalist attack on business that emerged in the 1980s. Then, economic growth and modernization, which had been Very Good Things, became Big Bad Business Destroying Planet Earth. Smart companies quickly accepted their responsibility to balance business and environment. IS will have to do the same. I doubt if the vendors will. They have too much invested in their strategy of "Innovate or die." IS already has a shaky reputation — bureaucracy, cost overruns, lack of communication and all the other long-standing concerns. Year 2000 is hardly helping improve matters.

It isn't enough to say that year 2000 and vendor irresponsibility aren't the fault of IS. That's like Wal-Mart saying poor-quality suppliers aren't its fault. Wal-Mart manages its suppliers on behalf of its customers. IS must do the same.

I've heard several jokes recently about how "Microsoft really runs our firm." IS must take real charge. It must guarantee simplicity instead of complexity, first-rate support and after-sales service, customer safety and impeccable operations.

It must anticipate the IT backlash and show that it stands for more than just the morass of technology complexity at the end of the Silicon Valley innovation chain. The IS "brand" has to be service and guarantees, not technology and best efforts. Alas, most IS shops aren't Wal-Mart. Why don't they try to be?□

Keen's book, The Business Internet and Intranets, *was published in February by Harvard Business School Press. He can be reached at peter@peterkeen.com.*

f.y.i.

Vertical industry watch

RETAIL: THINKING GLOBAL?

Retailers going overseas shouldn't think low-cost labor can substitute for information technology, says Ernst & Young.

In a recent study, *Global Retailing '97*, Ernst & Young notes that retailers believe low-cost labor in foreign markets can substitute for the information systems that are needed to manage inventories, adjust product offerings and provide real-time links between headquarters and far-flung operations.

But, "by the time they realize their mistake," says Fred Crawford, Ernst & Young's national director of Retail & Consumer Products Industry Services, "they have to spend millions more to replace outdated systems."

Some findings from the study include:

▶A lack of experienced IS managers and the absence of a standard communications infrastructure can significantly hamper implementing systems abroad.

▶Transferring domestic systems may be good for migrating a business's operating processes, but that may be just a short-term solution. Domestic systems are often too inflexible to handle different languages, currencies and operational requirements.

HEALTH CARE: FOCUS ON PATIENT DATA

Health care chief information officers are embracing new technologies that will make it easier for doctors and nurses to exchange data.

A report by Deloitte & Touche LLP found that CIOs in the industry are showing interest in data warehousing and voice recognition, among other technologies.

"IT investments will focus more strongly on providing patient information to health care providers when and where they need it," says Merlin J. Olson, a principal at Deloitte & Touche Consulting Group.

Indeed, a poll of 1,754 health care IS professionals, taken in late February at the convention of the Healthcare Information and Management Systems Society, found that voice recognition (31%) is likely be the top emerging technology in the next year, followed by wireless information appliances (18%), World Wide Web-enabled applications (14%) and handheld personal digital assistants (12%). Medical image transmission was named the top telehealth/telemedicine application in the next year.

Review Center

Workflow and E-mail

Trying to BRIDGE the gap

By David Strom

BUILDING AUTOMATED workflows on top of your enterprise E-mail system seems like a simple idea with big payoffs. You get to be more productive by automating E-mail communications. And you can reduce the flow of paperwork and cut approval times for routine office applications.

But getting your workflow up and running is anything but simple and will require lots of dedication and skill.

We tested JetForm Corp.'s InTempo and Keyfile Corp.'s Keyflow. InTempo is the more flexible product, working with a variety of E-mail systems and offering a wider choice of programming options. However, this flexibility comes at a price: It's complex, and extra care is needed during configuration. Keyflow works only with Microsoft Corp.'s Exchange. Both products allow World Wide Web-based users to participate in workflows and support traditional E-mail clients.

PRODUCT REVIEW

InTempo 3.0
JETFORM CORP.
Ottawa
(613) 230-3676
www.jetform.com
$20,000 (100-user license)

OVERALL GRADE B-

SERVER: Microsoft Exchange 5.5 and 5.0, Lotus Notes, Lotus CC:Mail, Internet standard SMTP/POP3, running on Windows NT Version 4.0 or Windows 95
CLIENT: Windows NT, Windows 95, various Web browsers

Keyflow 3.01
KEYFILE CORP.
Nashua, N.H.
(603) 883-3800
(603) 889-9259 (fax)
www.keyfile.com
$3,995 server, $195 per client

OVERALL GRADE B-

SERVER: Windows NT Version 4.0 with Service Pack 3, Exchange Version 5.0 with its Service Pack 2 or 5.5
CLIENT: Outlook 97 (Version 8.01 or later), Outlook 98 (Version 8.5), Exchange 5.0 with Service Pack 2 client, various Web browsers

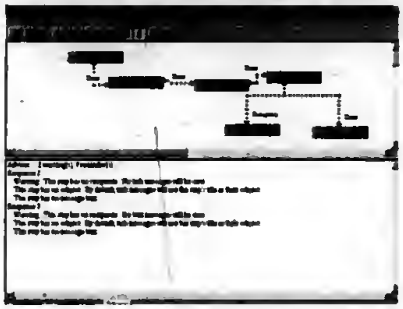
THE PUDDING

The two also differ in how workflows are designed, organizational tasks defined and workflows constructed. With Keyflow, everything is done through a single authoring tool, with all the functions present in different menu choices. InTempo comes in several pieces because it operates across many different E-mail systems, and you must be careful to understand their relationships before you attempt your first workflow.

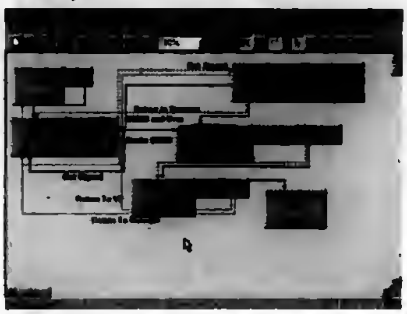
The differences in the two products are most noticeable when it comes to defining organizational roles (such as a manager or peer) and reporting relationships. Keyflow uses the built-in fields for manager and direct reports in Exchange for this task, whereas InTempo has a separate Organization Builder to set up and track who reports to whom in your organization. If you have taken the time to set up your Exchange address book with these reporting relationships, you will be a step ahead of the game when it is time to specify your workflows.

InTempo can't rely on the native Exchange organization data because you may not be running Exchange but some other E-mail system (such as a Simple Mail Transport Protocol Internet mail server) that doesn't track organizational relationships. That means that you'll have to create those relationships on your own, either by importing them from a central directory or typing them in. Roles make a great deal of sense if you want to preserve a workflow without having it depend on particular people. If people leave or change jobs, you don't have to modify the workflow.

There are other ways Keyflow relies heavily on Exchange. For example, it uses Exchange to authenticate users and set up rights to the shared folders in which its workflows are stored. There are benefits and drawbacks to being so closely tied to Exchange. If you have a solid Exchange network and all of your employees have Exchange mailboxes or are reachable via Exchange gateways, then you can leverage this investment and build the necessary workflows. If you can't reach everyone in your enterprise with Exchange, then forget about using Keyflow.



Keyfile's Keyflow relies heavily on Microsoft's Exchange



JetForm's InTempo works with a variety of E-mail systems

InTempo isn't specific to Exchange, of course, but has some further complexities, including a separate Administrator program to set various security and access controls and view the error logs. It's harder to use than the equivalent functions in Keyflow's software. InTempo also can build workflows with a wider variety of applications than Keyflow, including forms designed in Hypertext Markup Language or by JetForm's Java-based Designer and other JetForm products.

Installing either product is neither simple nor intuitive. Each required calls to technical support. You'll need a deep understanding of both your E-mail system and Windows NT user and domain administration to get both products working. You'll also need to learn the scripting language that each program uses to accomplish its automation.

We installed both servers on NT Server 4.0 with 96M bytes of RAM and Service Pack 3, along with Exchange 5.5 and Access 97 installed. That's the bare minimum configuration you'll want to use. Both products store their logs in databases that are more sophisticated than Access, but I didn't test those features. You'll also have to create a new user with administrative rights: The server portions of both products install themselves with this new user and create an NT service that can start up automatically. Neither product documents this well.

Both let Web users participate in viewing and responding to workflows. You'll need to install Internet Information Server 4.0 and a separate component from each product to make that work.

Workflow is still relatively new, and these two products are fairly immature. Both could be easier to use and deploy. If you have a series of tasks that would benefit from automation, have the necessary E-mail networks installed and can take the time to learn how to use them, then either should be suitable. □

Strom is a freelance reviewer in Port Washington, N.Y.

EXECUTIVE TECHNOLOGY

PERSONAL GPS

By James Connolly

GLOBAL POSITIONING SYSTEM (GPS) technology lets guys like me dream of the day when we will never have to ask for directions.

GPS can eliminate even that occasional need for directions. A navigation technology that relies on a network of satellites, GPS made its name helping pilots fly planes, mariners plot their courses and geologists map the Earth. Now, it's moving to the next level of practicality: helping executives get to that sales meeting with a new client in a strange town.

Looking for GPS technology that could appeal to an executive, I found what amounted to a 75% solution: The raw technology is there, but, I thought, "If only it were a little easier to use . . . If only it could . . . "

Dozens of companies sell GPS equipment, including handheld consumer items, vehicle-mounted tracking systems and marine and aviation products.

The U.S. Department of Commerce has estimated that GPS sales will reach $8 billion in 2000.

NeverLost

Hertz Corp.
Park Ridge, N.J.
Magellan Driver Information Systems, Inc.
Rochester Hills, Mich.
(800) 823-2547
PRICE: $6/day

That terminal with the 4-in. color screen sitting between the front seats of your Hertz rental car really can help you find your way right to the front door of your next appointment. Hertz began offering the Magellan technology, which blends GPS with what Magellan calls a dead-reckoning capability, as an option at selected airports in 1995. It is now available at 50 U.S. locations.

You select your destination — whether a street address or a public building — by toggling through menu choices. It takes a minute or less to enter an address and have NeverLost map out the best route on the screen.

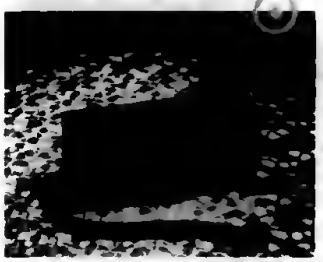
A mechanical voice guides you along the highlighted route, offering prompts such as, "Turn left on Route 1, one-quarter mile ahead" while you keep your eyes on the road.

NeverLost is accurate enough to earn the title, "Almost NeverLost." It was on the money as long as I was on major roads, but it got confused when I drove through a small seacoast town with narrow, winding streets.

A NeverLost-style system installed in your new car or as an add-on from a retailer might cost about $1,200 to $1,800.

GPS III

Garmin International, Inc.
Olathe, Kan.
(913) 397-8200
www.garmin.com
PRICE: $369 (street); $531 (list)



The GPS III was designed for recreational use, but I took it on a couple of business trips, and it proved helpful.

At 9 ounces and 5 inches long, this handheld device is compact and easy to use. Built-in maps of the U.S. show your location with relation to the most direct route to your destination or to landmarks such as state highways.

GPS III is best at finding locations you have already visited and marked. So you can use it for tasks like plotting a return trip to your hotel. When it comes to finding a new location, if you don't already know the GPS coordinates (not likely), you typically will be able to mark only the general neighborhood using the maps.

GPS works best outdoors, but the readings that the GPS III and the Magellan 2000XL offer inside a moving car are fine for the business traveler.

GPS 2000XL

Magellan Systems Corp.
Sunnyvale, Calif.
(408) 524-1400
www.magellangps.com
PRICE: $149.99 (street)

Computer buyers may be accustomed to more money buying more power. With the GPSs we tried, more money buys ease of use. The $200 difference between the Magellan and Garmin devices is reflected in how much more intuitive it is to use the Garmin and features such as the built-in maps.

The GPS 2000XL, only about an inch longer than the GPS III and comparable in terms of processing speed and accuracy, eventually did the job, particularly in terms of backtracking to the hotel. But the learning curve could be measured in hours.

Our GPS 2000XL came with a data module that ties it into a CD-ROM-based map system on a notebook PC. This helped me get around but, again, setup and use was a challenge, and the documentation was weak. □

Connolly is Computerworld's department editor, technology reviews/Review Center.

GPS IN YOUR FUTURE

Just work with GPS today, and talk to the vendors, and you can see the next few steps that will advance it beyond a 75% solution.

■Garmin last month shipped StreetPilot, a 1.2-lb. hand-size device designed for use in the car.

Garmin says its maps will cover state and federal highways and that optional data cards can provide city street-level mapping.

Unlike NeverLost-style systems, StreetPilot won't be hard-wired, so you should be able to move it from one car to another.

■Dozens of vendors are working to more tightly integrate GPS technology and mapping software with notebooks, handheld computers and cellular phones.

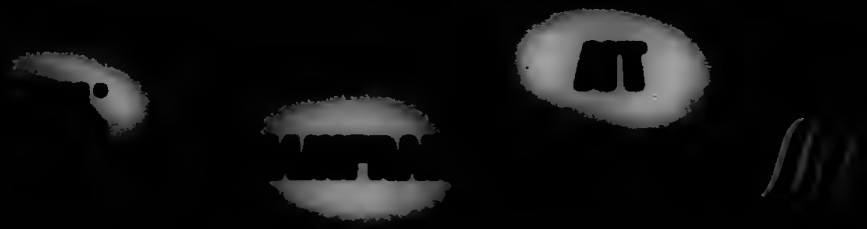
The off-the-shelf combinations, such as Magellan's, seem clunky right now. But picture a time in the not-too-distant future when all your sales representatives download their day's appointments and customer information and get step-by-step driving directions via their handheld computers.

HOW IT WORKS

GPS technology has its roots in U.S. Department of Defense programs but now thrives in the commercial sector. Twenty-four high-tech satellites orbit the Earth at 12,000 feet, continuously beaming their locations and the time toward the surface. GPS receivers collect the data from at least three satellites and use an algorithm to calculate the receiver's latitude and longitude for two-dimensional readings. To get three-dimensional accuracy (latitude, longitude and altitude), you need signals from at least four satellites.

Trying to Manage a Costly, Confusing IT Circus?

Let Us Solve Your Ringmaster



In Depth

OPEN SESAME

When Netscape Communications Corp. recently announced it would publish the source code for its Navigator browser, people at the company credited independent programmer, author and speaker Eric Raymond for building the momentum that led to the decision. His paper "The Cathedral and the Bazaar" had become the rallying point for the new "open source" software initiative, which holds that the best, fastest way to develop software is to publish the source code and let the world have at it.

This is Raymond's second "15 minutes of fame," as he puts it; he was the editor who helped turn the old Arpanet Jargon File of humorous, historical computer word derivations and definitions into *The New Hacker's Dictionary* (MIT Press), now in its third edition.

Daniel Dern, who usually runs in to Raymond at science fiction conventions, spoke to the prolific author at his home in Malvern, Pa., near Kennett Square, one of the mushroom-producing capitals of the world.

CW: How did you come to write your paper?

RAYMOND: I came to write "The Cathedral and the Bazaar" out of my feeling of profound shock when I first encountered the Linux operating system.

CW: Shock in what sense?

RAYMOND: This was in 1993. I had been writing software for 15 years, and I thought I understood how to produce high-quality software. I'd absorbed all the conventional engineering wisdom we know from Fred Brooks [author of *The Mythical Man-Month*] and other writers in the software engineering tradition: Keep your project group small, keep your objectives well-defined, keep everything tightly controlled, obsess about bugs and so on.

So I knew all these things, and then I encountered Linux and discovered that here was a development community that was violating basically every one of Fred Brooks' rules and somehow getting away with it to produce an OS which has no peers, as far as I'm aware . . . it's the best, the best in the world. And I found this so astonishing that I immediately decided two things: One, I'm going to be a part of this community, and two, I'm going to figure out how it works.

The process of figuring out how it works took me about three years.

CW: As your paper's title suggests, you ended up using cathedral and bazaar metaphors for different approaches to software development, with Microsoft as a major example of the former and initiatives such as Linux as examples of the latter. What did you conclude were some of the problems with the cathedral method?

RAYMOND: In the cathedral approach, you have a very closed, centralized, controlled style of development. In my paper, I point out that it appears that the underlying premise of the cathedral approach is that bugs in software are such

URLs:

▸ **Eric Raymond's home page:**
http://tuxedo.thyrsus.com/~esr
This page holds links to Raymond's papers, "The Cathedral and the Bazaar" and "Homesteading the Noosphere."

▸ **The Jargon File online:**
http://tuxedo.thyrsus.com/jargon

▸ **Open Source:**
www.opensource.org

deep and tricky phenomena that everything else about the process has to be subordinated to . . . find all the bugs.

This leads to the insulation of development groups, it leads to the long release cycles, it leads to the rigidly defined objectives and central control, and it leads to all the other things we think of as characteristic of proprietary software development.

The bazaar model is based on the premise that bugs are a fundamentally shallow phenomenon — that if you have enough people poring over the code and testing it in different ways, [bugs] become characterized and fixed extremely rapidly. And in order to maximize this effect, you need to release early and often, and grow your development community as rapidly as possible.

It's a 180-degree shift in perspective and management style, but the empirical evidence is that large projects that are run on a cathedral model have very poor reliability and develop uncontrollable complexities. On the other hand, large projects developed on the bazaar model . . . seem in general to succeed very well.

CW: You suggest that Linux was the first project to make a conscious and successful effort to use the entire world as its talent pool.

RAYMOND: That's correct. [This approach] gives you access to a talent pool that few if any companies will ever be able to attract in the classic closed approach.

Most importantly, most critically to the entire process, you have to be willing to publish source. Let the sources be seen.

CW: By "source" you mean . . . ?

RAYMOND: Modifiable source code for the software. Not the opaque block of bits that is normally delivered — not the compiled executables or whatever.

Now where is the central incentive for doing this? It's the reliability problem. The central problem of software engineering has always been that our reliability has been horrible. Awful, just completely unacceptable by the standards of any other branch of engineering. The reason is, we don't do what other kinds of research or engineering do: massive independent peer review.

In large-scale civil engineering or architecture, you would not trust a design for a bridge or a building that had not been independently peer-reviewed and seemed to conform to various standards of robustness and integrity by engineers outside the original construction group. Well, it's just completely insane to trust software — especially mission-critical software and infrastructure software — that has not been massively and independently peer-reviewed by other software engineers.

And that's why whenever reliability is a concern, sources must be open.

CW: Your sequel to "Cathedral" is called "Homesteading the Noosphere." OK, so what's a "noosphere"?

RAYMOND: It's a term of art from some schools of philosophy and mysticism . . . it basically means the "sphere of ideas." I wanted to make a distinction from "cyberspace," which is a much overused and rather horrible term.

In talking about the noosphere, I wanted to talk about the sphere of ideas — or more accurately, the sphere of possible projects — and I wanted to focus on and highlight and describe the processes by which volunteer groups and open source groups, whether commercial or volunteer, carve out new pieces of territory and how people essentially acquire a sort of community ownership of bits of that noosphere.

And that turns out to be a tremendously interesting thing to look at if you're interested in how to organize the development of software for maximum creative work and the highest quality of creative work.

CW: Your paper delineates some distinctions and differences between the open source model and the free software model. A lot of people in the corporate and commercial world exhibit legitimate concern when they hear "free software" — which sounds to them a lot like "no support."

RAYMOND: And they have a right to be concerned. Here's the deal: In the past, most of the arguments that Internet hackers have made for this style of development have tended to be essentially a priori and moral ones. "You should share software because it's the right thing to do." "You should share software because intellectual property is a bad thing." "You should this, you should that . . . follow my saintly example." This is the classic mode of evangelism that we associate with Richard Stallman and the Free Software Foundation. And there's a level on which that worked really well, in that Richard was successful in recruiting a great many programmers to do high-quality free software work and make those results available to the world.

[However,] those arguments are completely useless, even counterproductive, when retailed to corporate CIOs and venture capitalists who, quite properly, are interested in questions like, "How do I make my company grow and make a whole lot more money and get better reliability and more satisfied customers?"

openness and code-sharing lead to high reliability and better quality and so forth. But all the political and moral baggage associated with it was just turning people off.

CW: You're saying open source isn't necessarily free, and vice versa.

RAYMOND: Yes. You can have proprietary software that's not commercial. That's the classic shareware model, where people give out binaries but you don't get the source. Conversely, you can have open software that's quite thoroughly commercial, stuff for which the source is released but for which the company makes money by selling service on it. So these are two different axes, and we decided there was a need to convince the corporate world that open source is a good idea, that there are excellent selfish economic reasons to do it.

I'm not going to claim that open source is always the way to go. In fact, I discuss the unusual cases in which closed source is the way to go, on the Open Source site [*www.opensource.org*]. But in general, the idea that you're protecting a revenue stream by closing software is an illusion.

The industry has this model of itself as a manufacturing industry, where you make your product and then compile it into bits and shove it out the door and try to ignore your customers as much as possible because after-sales support is a cost center, not a profit center. This is fatally out of line with the cost structure of software development and the expectations and legitimate needs of consumers. □

'I coulda been a contendah' – Eric Raymond's version

"Back around 1989-1990, I worked with a guy named Ray Gardner on . . . a special-purpose little program we called VH [for Volks Hypertext]. You could page through the file and also follow references in the dictionary entries, back out of those references, and so forth and so on. . . . It did a significant fraction of what we now associate with the Web.

"A couple of years after the Web broke big, I was looking through my back E-mail, cleaning it out, and discovered I had a message in my mailbox from Tim Berners-Lee in 1991 — which I had forgotten because nobody knew who he was at the time.

"And he said, 'I looked at your VH, and it looks pretty interesting. I'm doing some work on hypertext, shall we collaborate a little bit?' And I wrote back and said, 'Sure, I'm really interested in this problem.'

"And he never got back to me. [Laughs.] It looks like because of one piece of lost mail from Tim Berners-Lee, I just missed being in on the beginning of the Web."

When the Netscape release went down, I was invited to consult with them for a day on some of the major issues [the company would face in giving away its source code] — licensing, community support programs, how they could erect a firewall around their development group so it wouldn't get mugged by their own corporate culture. The day after I talked with them, a number of free software and Linux people from Silicon Valley got together, and we talked about where do we go from here. One of the things we realized was that nobody had really tried to make the case for this way of doing things — which we knew was technically superior — that was palatable to Joe Average CIO. So we thought seriously about how to make that case.

One of the conclusions we came to is that the free software label is a net loss. The technical ideas behind it are really good in the sense that

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IT Careers

Do-it-Yourselfers

YEAR 2000 STAFFING REPORT:

IT managers have nowhere to turn for more year 2000 labor. Meanwhile, "volunteered" staffers find there ain't no fame or glory in this / **BY ROCHELLE GARNER**

Only 17 months until M-day: Jan. 1, 2000. The end of a millennium rocked by the Battle of Hastings, a couple of Crusades, two World Wars and now the "year 2000 bug." Looked at in historical context, this final challenge seems so, well, trivial. Surely, given the warnings sounded for the past two decades, the world's businesses have a handle on two measly digits.

Still laughing?

Given the progress so far in assigning information technology professionals to fix those pesky date codes, a little levity seems in order. It may be the last time anyone feels like laughing about the year 2000. The reason: No one, anywhere, can find people skilled in the ancient art of Cobol programming.

That isn't an overstatement. Last year, for example, CSC Consulting, Inc. in Lexington, Mass., and three other companies placed a full-page, $70,000 ad in *The Boston Globe* looking for IT professionals. The total number of resumes received listing Cobol skills? Zero.

IT CAREERS YEAR 2000

And the recruiting scenario goes downhill from there. "The chances of getting new people for year 2000 work are very slender," says Paul Miller, a contract technical recruiter in Billerica, Mass. Miller has spent much of his 20-year recruiting career searching for Cobol talent. "There simply aren't that many Cobol people out there anymore," he says.

And if you factor in the human animal's capacity for denial and procrastination, you have a year 2000 staffing situation that's far different from what people previously had predicted.

"Companies [are only] today at a point in both staffing and readiness that I had expected everyone to reach a year ago," says Bob Walker, technical training manager at Complete Business Solutions, Inc. (CBSI), an outsourcing company in Farmington Hills, Mich. "These efforts are taking far longer than anyone expected."

Not surprisingly, Bert Russo, CSC's vice president of legacy management services, predicts that "most corporations are not going to fix all of their mission-critical work in time."

The result? All assumptions are now off. Forget about hiring external providers to take on your remediation work. It's already too late to hire for that work. There's a record supply-and-demand gap in IT skills and labor. Many outsourcing firms are turning away new customers, and nearly all will completely stop taking new customers before year's end. Those companies that didn't lock in outsourcers — or that found them unavailable — are recruiting year 2000 workers strictly from within.

It's a case of "robbing Peter to pay Paul." Or, if you're lucky, getting your staff to do double duty.

"We have a special program, where we provide additional compensation to employees who, in addition to their regular jobs, volunteer for Y2K projects," says Catherine Davis, a compensation manager at Federal Express Corp. in Memphis. "We aren't hiring specifically for year 2000. And this program has proved successful at ensuring the staffing we need."

Do-it-Yourselfers, page 72

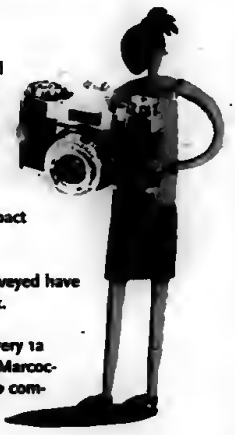
Say cheese

To understand year 2000's ramifications on staffing and work productivity, it's important first to take a snapshot of the world's progress in eradicating those two-digit datelines. According to Gartner Group, it's not a pretty picture.

Consider:

- **A full 35% of the world's businesses and government agencies have either no year 2000 activity whatsoever or are only now figuring out the scope of their problem.**
- **Another 15% have a fairly good idea of what must be fixed but are still putting together their budgets, test plans and impact analyses.**
- **And about 25% of the organizations surveyed have completed one-fifth of the necessary work.**

How does Gartner know this? Because every 12 weeks, Year 2000 Research Director Lou Marcoccio's group calls or visits people in 15,000 companies and government agencies in 87 countries.



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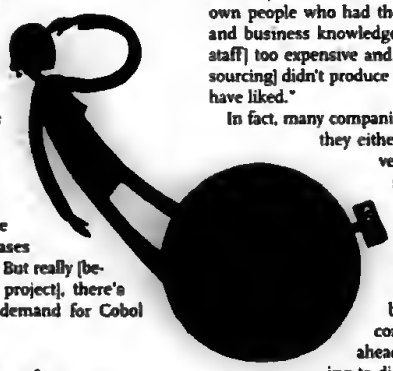
KAISER PERMANENTE

Do-it-Yourselfers

CONTINUED FROM PAGE 70

But for members of the year 2000 procrastination club, the fallout doesn't end with slim pickings in the job market. Projects once deemed critical for growth are being put on hold. And most paradoxical of all: Except in outsourcer companies, high salaries specifically for Cobol programmers are pretty much a myth.



"Rumors of sky-high salaries to Cobol programmers are garbage," says Lou Marcoccio, year 2000 research director at Gartner Group, Inc. in Stamford, Conn. "Sure, there may be a few cases where that happened. But really [beyond the year 2000 project], there's not that much of a demand for Cobol developers."

What do they have that I don't?

With all this talk about the bleak outlook for IT staffs just getting going on year 2000 work, is anybody safe?

"We find that large U.S. companies, which we define as having more than 20,000 employees, are in decent shape," Marcoccio says. "Most started early enough and have enough time to finish their mission-critical systems."

One such company is Xerox Corp. in Rochester, N.Y., which began its year 2000 efforts in earnest at the start of last year. That's when Sandy Lutrario became director of Xerox Information Management's year 2000 strategy and integration effort.

"I started by reading a couple of thousand articles from the Internet, searching for nuggets about what others have found out," Lutrario says. "And I learned that the effort was taking a lot longer than people had expected, that funding had to be in place and that resources would be an issue."

Armed with that knowledge, Lutrario instituted a policy that, it turns out, has been a godsend. She tied the year 2000 to Xerox's existing application portfolio system for the products it develops. That, in turn, gives Xerox a view of practically every application it runs around the world, measures the progress in year 2000 remediation and testing for each application and provides step-by-step procedures and deadlines for each phase.

"That put us in good shape with staffing, primarily because it wouldn't let managers out of the first gate in the planning phase unless they had signed up a vendor by mid-1997," Lutrario says. "Now, we have three major vendors, including [Electronic Data Systems Corp.], doing an outstanding job of remediation work in their factories. Our people are involved in the project management and the testing."

What's so intriguing about Xerox is that the company relies heavily on outsiders for most of its remediation work. According to Marcoccio, Xerox is in the minority among large businesses.

Career horizons

"The majority of companies are not using external service providers," he says. "A year and a half ago, most were planning to send out 50% of their code for remediation. But when they did, they found it tied up quite a few of their own people who had the internal application and business knowledge, [found outsourcing staff] too expensive and, in some cases, [outsourcing] didn't produce the quality they would have liked."

In fact, many companies privately admit that they either have stopped or severely scaled back their more-strategic projects — freeing up their staff for year 2000 tasks. The extent of that scaling-back is hard to gauge because only a few companies, those clearly ahead of the pack, are willing to discuss their year 2000 progress. Others, fearful of potential liability, prefer to keep a low profile.

The implications of such wide-scale involvement by IT staff on a single "maintenance" focus is unclear. When companies dedicate most of their internal resources to a single effort, it upsets all notions about employees' careers and salary.

Under these circumstances, Cobol expertise, by itself, doesn't make someone a star. In a universe where everyone joins in, star quality gets defined by attitude. Want to get ahead after the year 2000 crunch finally subsides? Then show a willingness to chip in, hone your ability to work with IT and business colleagues and — maybe above all — stay focused on a job that's tedious, dull and absolutely crucial.

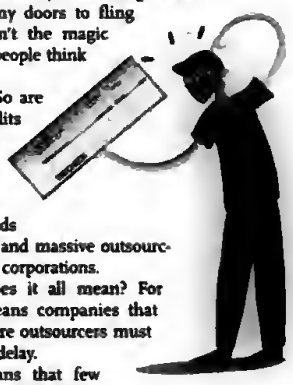
"We need people who are constantly customer-focused, constantly evolving, are team-oriented and results-driven," says Laurie Pellegrino, manager of human resources at Novartis Pharmaceuticals Corp. in East Hanover, N.J. "That means they continually learn new skills, so when one project goes away, they have the training and the career path for the next one."

The upshot: By itself, employees' stints on year 2000 neither hinder nor help their careers — unless they receive training in the next hot skill and as long as they display an understanding of business and an ability to work with others.

Paycheck blues?

And what about those vaunted paychecks everyone talks about? Well, people working for consultants certainly make out well, but that's a true regardless of project. Ditto for project managers, as that hard-to-find skill commands the highest salaries across all businesses. But Cobol programmers, it turns out, aren't making out as well as they might have expected.

For newbies, "We tell people to realistically expect about $27,000 a year, with no sign-on bonuses," Walker says. CBSI offers a Cobol boot camp for people trying to break in to the IT field. "Naturally, if they have a college degree, they can earn more money — from the mid-$40s to the low $60s. And we make sure they understand that just knowing Cobol won't cause any doors to fling open. This isn't the magic ticket a lot of people think it is."



Surprised? So are a lot of pundits who, a year ago, predicted sky-high salaries but career dead ends for employees and massive outsourcing work from corporations.

So what does it all mean? For starters, it means companies that still hope to hire outsourcers must do so without delay.

It also means that few companies will fix all of their mission-critical systems. Most, it seems, will be lucky to correct even 40% of their mission-critical applications, according to Gartner Group. And for many IT professionals, it means that all other work, designed to keep the world's economy humming, will grind to a crawl.

Still feel like laughing? □

Garner is a freelance writer in San Carlos, Calif.

What's in it for you?

Looking to cash in on the year 2000 craze? Then consider the following tips:

GO FOR THE GOLD

Yes, Cobol programmers can make big money. But there's a catch. You have to work for established external providers that guarantee training and work for all sorts of projects. That means avoiding shops set up specifically for year 2000 work. And be warned: Consultancy work is a nomadic existence, spending a few months at a customer site and then moving on to the next one.

ATTITUDE ADJUSTMENT

Sure, year 2000 work can be mind-numbingly tedious. And no, you won't show off your computer skills by tracking down and eradicating those elusive double digits in date fields. But that doesn't mean year 2000 projects can't help your career. The trick here: Show your colleagues and your boss a willingness to work with others, a concern for the corporate well-being and an enthusiastic attitude. Those softer attributes will help you get ahead in every company for every project.

GET THE PICTURE

With all those other projects being put on hold, companies eventually will show pent-up demand for more exciting stuff. You know, implementing SAP, programming with object-oriented languages, using Java for electronic commerce — and whatever else becomes crucial for a competitive edge. True, most companies say they offer a career path for their IT staff now engaged in year 2000 work. Just don't accept that fact on face value. Get your supervisors to lay out a clear picture of upcoming training, future projects and requisite skills. Remember, your career path is still your responsibility.

— Rochelle Garner

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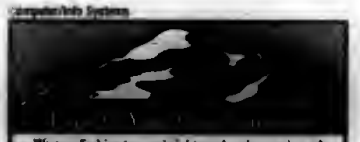

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Fax 319-668-5058

EXECUTIVE TRACK

Robert H. Benmosche formerly executive vice president in charge of information systems at PaineWebber, Inc. in New York, has been named president and chief operating officer at Metropolitan Life Insurance Co., a financial services company, also in New York.

George A. Brenner has joined Commercial Programming Systems, Inc. (CPSI) in Los Angeles as vice president of the new consulting services division. CPSI is a technical recruiting firm. Previously, Brenner was chief information officer and vice president at Universal Studios, Inc., an entertainment company with headquarters in Universal City, Calif.

Ruth E. Bruch has been named CIO at Danbury, Conn.-based Union Carbide Corp., a worldwide chemical and polymers company. Previously, Bruch was director of information technology strategic planning at Union Carbide.

Jeff Bundy has been named CIO at the YMCA of the USA, based in Chicago. The collective YMCAs are nonprofit community service organizations working to provide health and social services. Prior to this appointment, Bundy was CIO at the YMCA of San Francisco.

Dean Campbell, formerly CIO at Children's Hospital in Los Angeles, has been named vice president of the health care practice at Systems Management Specialists, a leading national IT consulting firm and services provider in Costa Mesa, Calif.

Tony Crow has been named manager of the corporate IS department at Southwire Co. in Carrollton, Ga., a leading cable and-wire manufacturer. Prior to joining Southwire, Crow had several years of experience in IT marketing management, human resources and general accounting.

Thomas Eastwood has been named vice president and CIO at The Tribune Co., a media company with operations in television and radio broadcasting, publishing, education and interactive ventures. Prior to joining The Tribune Co., Eastwood was chief technology officer at SportsLine USA, an Internet-based sports media company. He was one of the founders of SportsLine.

Don Haile has joined Fidelity Investments, a financial services company in Boston, as executive vice president of enterprise solutions. Previously, Haile worked as vice president of development at IBM in Armonk, N.Y.

Donald G. Hedeen has been named director of the Automotive Network Exchange, a division of the Automotive Industry Action Group in Southfield, Mich. Previously, Hedeen was director of architecture standards at General Motors Corp.'s Information Systems and Services Division in Flint, Mich.

Rick Hildebrandt has been named vice president of IS and CIO at Citizens Communications in Stamford, Conn., one of the nation's largest community-based communications providers. Prior to the appointment, Hildebrandt was executive director of high-end and network systems at Pacific Bell.

Paul D. Kallis has been named chief technology officer and corporate senior vice president at Playboy Enterprises, Inc. in Chicago. Previously, Kallis was senior vice president of Marvel Interactive at Marvel Entertainment Group, Inc. Kallis has held positions at Philips Media, a division of Philips Electronics, the National Energy Research Supercomputing Center and AT&T Bell Laboratories.

John G. McCarthy has been named chief technology officer at RealMed Corp. in Indianapolis. **McCarthy** has more than a dozen years' experience in systems design and development at several firms.

Nadine Miller has been named director of IT at Ellenbogen Rubenstein Einsdorfer & Co., a New York-based accounting firm. Prior to joining the firm, Miller worked as a LAN administrator for The Partnership for a Drug Free America, also in New York.

Roy S. Nicolosi has been named senior vice president and CIO at Insurance Services Office, Inc. in New York. Nicolosi previously was senior vice president of IT at Gtech Corp. Prior to that, he was a consultant at Nynex Corp. in New York.

Daniel Page has been named director of corporate information services at Chesapeake Corp., a tissue, special packaging and forest resources company in Richmond, Va. Previously, Page was technical manager of infrastructure services at Lucent Technologies in Atlanta.

Stephen J. Pickett has been named vice president of IT at Penske Corp., a Detroit-based transportation service company. Pickett previously was CIO at ITT Automotive in Auburn Hills, Mich.

Mark Polansky has been named president of the Greater New York Chapter of the Society for Information Management, an organization that provides leadership and education in the management and use of information technology. Polansky is a managing director at the New York office of Korn/Ferry International, a professional search firm.

Vyto Razminas has been named to the newly created position of CIO at Flowers Bakeries, Inc., a baker of breads and rolls in Thomasville, Ga. Razminas previously was senior group manager of IS at Frito-Lay, Inc. in Plano, Texas.

Wayne Sadin has been named executive vice president and CIO at Bank United in Houston, a subsidiary of Bank United Corp. Prior to joining Bank United, Sadin was senior vice president, chief technology officer and director of IT at Michigan National Bank in Lansing.

Eric Singleton has been named vice president and CIO at Columbia Energy Services, a Columbia Energy Group company in Reston, Va. Singleton previously was vice president of IS of the automotive products group.

Robert C. Smallback Jr. has been named IS manager at Lee County Port Authority in Fort Myers, Fla. Smallback will be responsible for IT activities at Southwest Florida International Airport and Page Field General Aviation Airport.

Leonard Tripp has been elected 1999 president of the Institute of Electrical and Electronics Engineers Computer Society, an association of computing professionals in Washington. Tripp is an associate technical fellow in software engineering at The Boeing Co., an aerospace company in Seattle.

Edward D. Winfield has been elected to the board of directors of The Automotive Industry Action Group, a not-for-profit association of North American auto and truck manufacturers and their suppliers in Southfield, Mich. Winfield is manager of information technology worldwide at the Engine Components Division of Eaton Corp., which manufactures engine components and electrical equipment and controls in Cleveland. □

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System Engineer. Implement and maintain computer systems for Urdu/English language newspaper. Manage and administer databases and data processing systems. Customize and maintain Urdu language software applications. Develop business and accounting applications. Maintain computer hardware. Tools: COBOL, PASCAL, IBM Macintosh, Urdu software (Kalib, Globel, Shahkar). B.S. in Computer Science* plus 6 months experience in the job offered or as a Programmer required. (*Will accept degree in electronics engineering) Previous experience must include: implementing and managing Urdu language software, COBOL, maintaining databases. 40 hrs/wk, 8:30 am - 5:00 pm. $23.98/hour. Must have proof of legal authority to work permanently in the U.S. Send two copies of both resume and cover letter to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, IL 60605, Attention: Brenda, Kelly. Reference #V-IL-18627-K. NO CALLS. An Employer Paid Ad.

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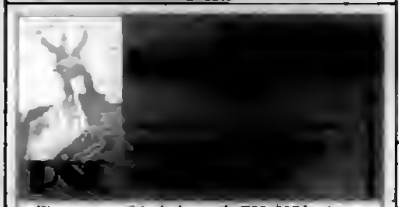

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FALL Campus Edition

Issue: October 26, 1998
Space Deadline: September 18, 1998

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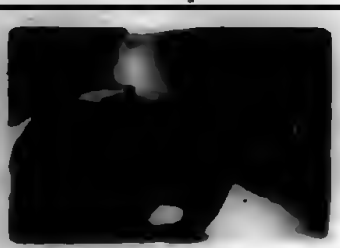

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A Full Schedule of Contemporary Topics

7:45am **Continental Breakfast & Conference Registration**

8:30am **Concurrent Sessions:**
- **Building an Internet Recruitment Strategy** *Tracey Claybrooke, Claybrooke & Associates*
- **Attracting, Retaining and Engaging IT Talent** *Jackie Cudahy & Len Tenner, Hewitt Associates*
- **High Tech/High Touch: Creating the Recruiting Office of the Future** *Sue Keever, The Keever Group*

10:00am **Sponsor Showcase/Coffee Break**

10:30am **General Session: Recruiting - Into the Next Millennium** *Gary Cluff, President, Cluff & Associates*

12:00pm **Luncheon Keynote: Joe Maglitta, Industry Editor, Computerworld**

1:30pm **Town Hall Forum** *Mark Jeske, Moderator, May & Speh*

3:00pm **Sponsor Showcase/Coffee Break**

3:30pm **Concurrent Sessions repeat:**
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- **Attracting, Retaining and Engaging IT Talent** *Jackie Cudahy & Len Tenner, Hewitt Associates*
- **High Tech/High Touch: Creating the Recruiting Office of the Future** *Sue Keever, The Keever Group*

5:00pm **Program ends**

Selected Sessions Include:

Luncheon/Keynote Address

Joe Maglitta
Industry Editor, Computerworld

Joe Maglitta, one of the industry's leading watchers of the Information Systems profession, will give you an up-to-the-minute view in this very special keynote address.

Building an Internet Recruitment Strategy

Tracey Claybrooke
President, Claybrooke & Associates, Inc.

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Recruiting - Into the Next Millennium

Gary Cluff
President, Cluff & Associates

The rapidly growing economy and the baby bust have combined to create today's highly competitive technical recruiting market. Will it be survival of the fastest, or the richest, in the years ahead? This look at the demographics, recruiting trends, reengineering efforts and emerging practices in the employment industry may help to identify what we can expect as we rush into the new millennium.

Town Hall Forum

Mark Jeske
Recruiting Manager, May & Speh

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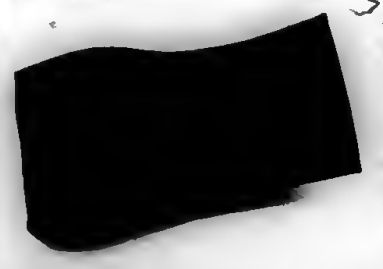

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The Week in Stocks

Gainers

PERCENT

Eastland Discount Software (H)	144.4
Manugistics Group, Inc.	24.7
Synsoe Inc.	24.5
Computer Horizons	19.3
Nokia Corp.	18.9
Optical Data Systems Inc.	17.6
Interactiv Inc.	16.9
Hyperion Software Corp.	16.6

DOLLAR

Eastland Discount Software (H)	13.00
Gateway 2000 Inc. (H)	7.88
Dell Computer Corp.	7.56
Yahoo! Inc. (H)	7.38
Computer Horizons	7.13
SEI Corp.	6.75
Intel Corp.	6.19
Manugistics Group, Inc.	5.94

Losers

PERCENT

Gadzoox Networks Inc. (L)	-28.2
Cayenne Software Inc. (L)	-28.0
Gadzoox Ltd (L)	-26.3
Struct. Dynamics Research (L)	-26.3
ECD Inc.	-23.8
Excite, Inc. (H)	-21.1
Interbrand Inc.	-17.9
Ameritech (H)	-16.9

DOLLAR

Excite, Inc. (H)	-21.38
Ameritech (H)	-20.63
Lycos Inc. (H)	-13.63
Gadzoox Networks Inc (L)	-7.25
Struct. Dynamics Research (L)	-5.56
Informix Corp.	-5.13
At Home Corp.	-4.25
Netscape Comm. Corp.	-4.19

INDUSTRY ALMANAC

Enter the portal

A seasonal virus appears to have struck Wall Street again as investors have become feverish about Internet stocks. The latest outbreak seems to have started a month ago when NBC paid $5.9 million for a 19% stake in CNET, Inc.'s (Nasdaq:CNWK) Snap Internet portal service.

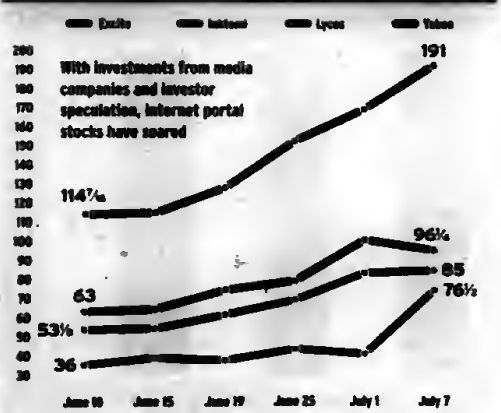
NBC CEO Robert Wright said in a news conference that the investment was designed to bring greater visibility to NBC's content on the Internet. CNET's stock jumped 24% the day of the investment.

The fever really began to climb a week later when The Walt Disney Co. (NYSE:DIS) bought a 43% share of Sunnyvale, Calif.-based portal and search engine maker Infoseek Corp. (Nasdaq:SEEK). The day of that announcement, Infoseek's stock shot up 139%.

Portal stocks soared again last week when Lycos, Inc. (Nasdaq:LCOS) announced a two-for-one stock split. That day, its stock gained 25%, and both Excite, Inc. (Nasdaq:XCIT) and Yahoo, Inc. (Nasdaq:YHOO) showed dramatic leaps spurred by rumors that some large media companies were interested in spiffing up their World Wide Web images by investing in a portal.

Mary Meeker, an analyst at Morgan Stanley Dean Witter in New York, described the frenzy in a recent report: "We have entered a new valuation zone," she wrote. "We have one general response to the word valuation . . . and it's 'bull market.' " — Stewart Deck

PORTAL FEVER



Issue	52-Week	Range	July 10	$ Net Change	% Pct Change
NASDAQ National Market					
COMS	58.88	22.94	1 COM Corp	35.75	0.88	-0.2
Art	30.75	8.813	Ameritech Corp	46.13	1.00	2.4
ASND	56.75	22.00	Ascend Communications	52.31	3.56	7.3
T	88.50	34.00	AT & T	56.94	3.31	6.2
BBYN	13.88	1.75	Banyan Systems Inc	8.88	0.88	12
BAY	41.88	33.38	Bay Networks Inc	33.25	1.50	4.9
BEI	53.00	34.00	Bell Atlantic Corp	50.50	0.13	0.3
BLS	88.50	41.81	Bellsouth Corp	50.13	2.50	1.6
BRKT	22.75	9.50	Broadcast Technology	14.38	0.88	0.0
CS	58.50	11.94	Cabletron Systems	12.94	0.18	3.9
CGRM	21.88	8.56	Centillion Communications	10.50	0.94	7.9
CSCO	94.94	43.50	Cisco Systems Inc (H)	92.88	0.19	0.2
CMNT	8.13	3.31	Computer Network Tech	5.88	0.75	16.2
CNCH	41.00	1.88	Connectrix Networks Corp (H)	15.50	0.25	0.7
DIGI	33.94	16.50	DSC Communications (H)	33.18	3.00	9.6
FORE	30.75	13.25	FORE Systems Inc	24.88	1.25	4.8
GDC	8.50	1.25	General Datacomm Indus	3.44	0.50	10.1
GSH	53.00	33.00	Gensler Signal Networks (L)	36.44	0.56	1.6
GTE	64.38	49.50	GTE Corp	56.19	0.50	0.8
LU	88.13	36.19	Lucent Tech (H)	85.88	3.06	3.6
MADGF	9.19	3.75	Madge Networks BV	5.00	0.19	0.0
MCIC	62.88	37.31	MCI Communications Corp (H)	61.00	0.31	0.5
METM	5.25	2.00	Netmanage Inc	2.94	-0.31	9.7
NTRY	3.50	0.44	Netrix Corp	3.25	0.44	18.9
NCDI	13.75	5.88	Network Computing Devices	8.25	0.25	3.1
NWK	22.88	11.44	Network Equipment Tech	15.88	-0.75	4.8
NN	69.38	10.94	Newbridge Networks Corp	26.38	0.50	2.4
NT	80.25	38.88	Northern Telecom Ltd	57.63	2.50	3.7
NOVL	13.44	6.06	Novell Inc	12.56	0.13	1.0
ODSY	14.50	5.38	Ornetal Data Systems Inc	7.81	1.09	17.8
PCTL	13.50	5.61	Picturetel Corp	6.50	0.11	1.7
OPEN	3.50	0.97	Premisys Inc	1.34	0.19	16.2
RACO	4.13	1.00	Racotek Inc	3.75	0.00	2.9
RADS	29.38	6.38	Radiant Systems Inc (L)	3.19	7.25	50.3
RTEC	11.50	1.63	Retek	4.38	0.00	0.0
SBC	46.50	38.75	SBC Communications	39.00	-0.88	-0.2
SFE	27.94	14.00	Scientific Atlanta Inc. (H)	24.75	0.88	3.4
SPYR	18.44	6.00	Spyrus Corp	8.50	0.19	2.2
TCIN	75.63	44.00	Tricord Corp	74.38	1.63	5.1
QWST	41.00	13.81	QWest Communications Int	37.50	1.44	4.0
SMSC	18.13	8.00	Standard Microsystems Corp	6.88	0.00	0.0
USRX	38.00	23.63	U S West Inc	30.63	1.81	5.7
VIRC	18.88	8.63	Viscorp	15.00	0.50	3.3
XYLN	33.31	13.88	Xylan Corp	21.00	1.31	4.6
NASDAQ National Market						
AAPL	63.94	12.75	Apple Computer Inc (H)	32.19	2.44	8.2
CPQ	58.75	20.75	Compaq Computer Corp	57.00	3.44	12.0
DELL	100.44	31.38	Dell Computer Corp	100.44	7.50	8.1
GTW	61.00	25.00	Gateway 2000 Inc (H)	61.00	7.86	18.8
HWP	82.38	50.00	Hewlett Packard Co.	76.25	1.63	2.8
MLHY	21.00	8.44	Micron Interchange, Inc	13.56	1.44	14.2
NIPNY	72.75	44.94	NEC America	46.50	0.25	0.5
SGI	40.31	10.94	Silicon Graphics	13.88	1.88	8.9
SUNW	53.31	30.38	Sun Microsystems Inc	45.75	3.00	7.0
NASDAQ National Market						
DGN	57.94	13.38	Data General Corp	15.63	0.38	2.5
IBM	180.31	68.81	IBM	118.75	2.94	2.5
MDCD	6.63	3.33	Meridian Data Inc	4.75	-0.50	-9.5
NCR	38.38	25.63	NCR Corp	32.63	-0.50	4.5
PRCM	58.50	0.33	ProCom Technology Inc.	7.00	0.13	1.8
SQNT	81.75	80.50	Sequent Computer Sys	11.38	-0.44	3.7
TEXM	6.38	2.50	Texas Micro Inc	3.00	-0.00	1.9
SRA	80.75	21.44	Stratus Computer Inc (L)	22.13	3.88	33.5
UIS	88.94	7.94	Unisys Corp (H)	27.56	-0.13	-0.5
NASDAQ National Market						
ADBE	53.13	13.00	Adobe Systems Inc	30.50	0.75	2.8
AMSWA	13.63	8.75	American Software Inc	6.88	-0.88	5.2
APLX	13.50	5.50	Applix Inc	3.88	0.00	3.6
ARSW	53.25	27.19	Arbor Software	34.61	4.63	13.3
ARDT	13.88	8.63	Ardent Software	14.88	0.75	5.3
ARTC	10.38	3.25	Artic Corp	10.25	0.25	0.9
ADSK	53.13	30.00	Autodesk Inc	35.44	1.31	3.8
BMCS	51.88	27.00	BMC Software Inc	31.75	1.75	3.3
BOOL	26.00	15.63	Books and Bagels	24.38	1.56	6.8
BOBY	80.00	4.63	Business Objects	14.44	3.00	6.9
CAYN	1.50	0.72	Cayenne Software Inc (L)	0.72	-0.72	50.0
CNEB	1.81	0.88	Cenetics Software	1.56	0.00	3.6
CHKPF	50.50	22.06	Checkpoint Software	31.06	-0.50	-2.2
CDGNF	34.75	17.83	Cognos Inc	28.50	0.00	3.4
CA	81.50	33.44	Computer Associates	56.25	1.25	2.2
CPWR	55.19	39.13	Computware Corp (H)	55.19	4.81	8.8
CSRE	12.13	4.25	Corporate Inc	7.50	0.38	4.8
COMS	8.44	1.00	Comsi Corp	1.31	-0.22	10.8
DBTI	5.88	2.03	Database Technologies Inc	1.50	0.25	7.7
DCTM	86.63	34.50	Documentum Inc	50.13	5.13	8.6
FILE	31.00	9.38	Filenet Corp (H)	29.00	3.38	5.3
FPTE	10.56	3.00	Fourth Software	5.75	0.88	0.3
FTPS	3.88	1.00	FTP Software Inc	1.75	-0.16	8.2
GPSI	80.00	80.00	Great Plains Software Inc	38.63	0.37	0.8
HUMC	54.25	25.25	Humanscape Comm Tch	25.91	-0.22	-0.8
HYSW	88.63	23.50	Hyperion Software Corp	32.44	4.63	16.6
IDIC	80.00	12.38	Information Resources	19.00	0.44	2.4
INFM	12.44	4.06	Informix Corp.	3.06	-0.06	-0.8
INGR	19.38	5.88	Intergraph Corp	8.19	0.50	7.8
INGR	14.16	7.19	Interleaf Inc	7.75	0.56	4.8
LEAF	4.00	1.88	Interleaf Inc	1.44	-0.31	17.9
ISLI	29.25	9.88	Intuitive Inc	18.81	3.00	16.9
INTU	69.25	45.50	Intuit Inc.	62.88	0.75	1.4
JDEC	45.38	24.88	J D Edwards Co (H)	43.25	2.13	4.9
TLC	30.06	8.56	Learning Co (The) (H)	28.63	0.06	0.2
MANU	66.38	38.50	Manugistics Group, Inc	38.94	3.94	24.7
MAPS	14.25	8.88	Mapinfo Corp	11.13	0.75	7.2
MATH	6.63	2.38	MathSoft	3.38	0.06	1.8
MENT	13.13	8.13	Mentor Graphics	8.56	-0.75	7.3
MICV	68.63	38.13	Micro Focus	38.00	0.75	1.0
MCRI	14.88	5.75	Microcraft Inc	13.50	0.00	0.0
MSFT	112.06	80.06	Microsoft Corp (H)	131.33	3.44	2.7
ORYS	5.25	0.44	Orbit Systems, Inc.	2.63	0.00	0.0
ONTI	13.88	4.13	Ontrack Ltd (L)	3.94	2.81	86.1
ORCL	42.19	17.75	Oracle Corp	24.75	1.81	7.9
PMTC	36.31	14.44	Parametric Technology (L)	14.50	0.00	1.7
PSFT	57.44	26.00	Peoplesoft	50.19	4.06	9.1
PTEC	18.38	8.88	Phoenix Technologies	11.81	0.56	5.0
PSQL	89.25	7.50	Platinum Software (H)	23.06	-1.44	5.9
PLAT	34.31	33.94	Platinum Technology (H)	32.19	2.81	9.6
PEGS	42.00	18.88	Progress Software Corp (H)	38.63	1.63	4.4
RNBO	30.00	10.63	Rainbow Technologies Inc	21.06	3.38	19.0
RBDB	11.63	3.63	Red Brick Systems Inc	4.88	0.88	0.0
ROSS	5.88	3.00	Ross Systems, Inc	4.91	0.16	3.1
SCOC	7.25	5.25	SCO Inc	3.50	1.00	-22.2
SDTI	48.38	15.13	Security Dynamics Tech	17.38	-0.33	-0.7
SSW	30.31	15.88	Sterling Software Inc	28.31	0.94	3.2

Issue	52-Week	Range	July 10	$ Net Change	% Pct Change
SDRC	50.88	19.81	Struct Dynamics Research (L)	13.75	5.50	28.1
SYBS	23.63	8.11	Sybase Inc	8.56	1.69	24.5
SYMC	37.81	17.88	Symantec Corp	24.81	2.00	9.1
SNPS	47.13	29.13	SynOpsys	42.13	-0.88	2.0
SSAI	11.50	8.75	System Software Assoc (L)	8.13	-0.56	-6.5
SYSF	34.50	1.00	Systemsoft Corp	1.25	-0.16	11.0
BARNF	35.50	20.56	Sun Basin Co	30.56	2.00	8.4
TRUV	3.19	0.75	Truevision Corp	1.25	0.00	0.0
VIAS	65.25	12.38	Visioni Inc	14.38	1.31	8.4
VSIO	30.00	18.50	Visio Corp	47.75	0.50	1.1
WALB	20.00	11.88	Walker Interactive Systems	14.25	0.00	0.0
WALI	21.88	10.13	Wall Data Inc	19.00	0.11	0.6
WANG	32.25	10.63	Wang Laboratories Inc	24.75	-0.75	2.9
NASDAQ National Market						
AMZN	143.75	11.63	Amazon.com (H)	99.25	20.19	16.6
AOL	115.00	31.13	America Online (H)	112.38	2.94	2.7
ATHM	57.25	16.83	At Home Corp	47.63	-4.75	8.3
EDFY	32.13	8.06	Edify Corp	10.31	-0.38	1.8
ICGI	311.00	14.25	Excite Inc (H)	78.88	23.25	31.1
SEER	49.06	9.69	Infoseek Corp	32.00	5.13	13.8
LCOS	107.25	13.00	Lycos Inc (H)	87.88	13.13	14.3
NSCP	48.50	19.88	Netscape Comm Corp	36.50	-4.38	10.3
NSOL	30.88	11.75	Network Solution Inc	41.50	2.31	5.2
OMKT	39.13	8.88	Open Market Inc	17.81	1.75	8.6
PICS	11.06	12.50	Pegasus Systems	26.31	0.06	0.2
PSIX	15.75	6.25	PSINet (H)	14.25	0.94	7.0
QDEA	3.44	0.63	Quarterdeck Corp	0.50	0.19	12.5
SCUB	15.25	3.50	Secure Computing Corp	10.50	0.13	1.2
SPYG	15.50	4.06	Spyglass Inc	11.38	0.75	6.2
YHOO	309.50	27.19	Yahoo! Inc (H)	279.00	7.38	4.3
NASDAQ National Market						
AMD	42.75	25.88	Advanced Micro Devices (L)	13.38	1.25	3.5
ADI	39.63	22.00	Analog Devices Inc	25.13	0.16	0.6
CRUS	19.75	8.50	Cirrus Logic	11.44	0.25	2.3
CY	18.94	1.50	Cypress Semiconductor Corp	8.19	0.00	0.0
INTC	102.00	65.88	Intel Corp	80.00	0.19	0.4
LSCC	74.50	25.63	Lattice Semiconductor	32.06	2.81	8.6
LSI	80.75	38.50	LSI Logic Corp	33.44	0.38	1.6
MCRL	50.88	31.38	Micrel Semiconductor Inc	31.50	1.69	5.1
MU	80.88	20.00	Micron Technology	29.75	3.63	13.9
MOT	90.50	80.56	Motorola Inc	52.00	0.13	0.3
NSM	42.00	12.31	National Semiconductor (L)	12.56	-0.63	-4.7
RMBS	80.75	60.88	Rambus Inc	57.88	1.00	1.8
TXN	71.25	38.63	Texas Instruments	50.00	0.88	1.8
VLSI	38.69	14.38	VLSI Technology	17.63	1.00	6.4
XLNX	57.38	38.50	Xilinx	37.00	3.00	10.8
NASDAQ National Market						
ADPT	54.25	12.50	Adaptec Inc	13.38	-0.63	4.6
APCC	56.88	18.50	American Power Conversion	29.63	-2.13	-0.3
AMDA	3.81	1.00	Andataco Inc	1.50	0.06	0.0
CREAF	89.38	13.00	Creative Technology Ltd.	13.10	0.81	6.6
RACE	12.13	0.50	Race Inc	0.63	0.00	0.0
DTM	13.69	1.88	Datamax Corp	12.23	-0.38	3.0
EMC	47.88	28.50	EMC Corp	47.88	3.00	6.7
EMLX	19.75	5.31	Emulex Corp	6.50	0.63	10.6
ESCC	25.88	21.44	Evans and Sutherland	27.13	1.31	4.8
EXBT	14.13	5.63	Exabyte	7.31	-0.72	8.9
ISFD	4.50	1.88	Intelligent Info. Systems (L)	1.28	-0.13	8.6
IOMI	18.75	4.75	Iomega Corp	5.81	0.13	2.2
KMAG	23.75	5.13	Komag Inc	6.00	0.50	0.1
MTSI	34.88	13.00	Micro Touch Systems Inc	17.75	-0.00	0.0
MTIC	17.88	6.38	MTI Technology Corp	6.88	1.38	19.0
AQM	23.88	2.25	QMS Inc	3.50	0.00	1.8
QNTM	40.25	13.75	Quantum Corp	20.38	1.06	5.4
RDUS	8.13	2.25	Radius Inc	2.75	0.38	15.8
SEG	30.50	12.75	Seagate Technology	24.31	1.69	7.5
SOS	14.00	3.50	Storage Computer Corp (L)	4.13	0.50	13.8
STK	50.13	43.25	Storage Technology (H)	45.56	1.88	4.3
TEK	88.19	33.94	Tektronix Inc	33.94	0.13	0.3
WDC	34.75	30.25	Western Digital Corp	32.25	0.75	0.3
XRM	133.06	66.19	Xircom Corp	108.00	5.38	5.3
NASDAQ National Market						
AMSY	33.13	17.50	American Mgmt Systems	20.88	-0.63	-2.9
ANLY	36.38	21.38	Analysts Int	27.88	-0.38	1.3
AUD	75.50	40.56	Auto Data Processing (H)	72.94	0.06	0.1
CATP	58.38	31.00	Cambridge Tech Partners (H)	50.38	2.63	4.0
CEN	61.75	32.13	Cardinal Corp	56.75	1.88	3.8
COD	23.25	13.44	Comshare Inc	20.44	-0.00	3.3
CPU	54.00	34.50	CompUSA Inc	38.81	1.81	10.9
CHRZ	51.50	25.75	Computer Horizons	44.00	7.11	19.3
CSC	80.25	33.63	Computer Sciences (H)	64.38	0.31	0.5
TSK	48.38	27.00	Computer Task Group	37.88	3.88	10.0
EGGS	22.06	3.06	Egghead Discount Software (H)	22.06	13.06	144.4
EDS	58.88	29.56	Electronic Data Systems Corp	37.56	-0.94	-2.4
ICO	30.63	22.63	Imacon Corp	33.06	1.44	4.5
REA	80.94	24.00	Reuters Inc. (H)	58.88	2.63	4.7
NNCA	29.75	18.06	Micrografx Inc.	16.50	0.44	2.1
PAYX	45.81	21.69	Paychex	42.00	1.75	4.0
PMS	45.50	24.00	Policy Management Sys.	38.69	1.16	3.1
REY	24.00	10.44	Reynolds and Reynolds	17.88	-0.13	-0.7
SAPE	50.38	23.88	Sanchez Corp (H)	57.50	-2.00	3.8
SCBI	14.75	8.38	SCB Computer Tech Inc	10.00	-0.06	-0.8
SEIC	50.88	25.75	SEI Corp	88.25	8.75	10.0
SMS	82.69	47.50	Shared Medical Systems	78.38	3.75	5.0
SSPE	24.75	10.75	Software Spectrum Inc	21.63	0.50	2.0
SDS	40.00	45.44	Sungard Data Systems	37.94	0.00	1.6
SYNT	39.88	5.00	Synetic Inc	20.75	-0.81	-3.7
VSTI	17.25	11.00	VanStar Corp	56.63	-0.38	-2.5

KEY. (H) = New annual high reached in period (L) = New annual low reached in period

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Microsoft lawyers prepare

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al, the Microsoft legal team knows the U.S. Department of Justice lawsuit is the most critical legal battle in Microsoft's history. If the lawyers — including one of the most elite litigation firms in the country, New York's Sullivan & Cromwell — fail in their mission, the outcome could significantly change how the company does business and builds and markets products.

IN OPPOSITE CORNERS

Bill Neukom, senior vice president of law and corporate affairs, Microsoft
Years there: 13
Age: 57
Law school: Stanford University

Joel Klein, assistant attorney general, Justice Department
Years there: 2
Age: 52
Law school: Harvard University

Source: Martindale-Hubbell Law Directory, New Providence, N.J.

As such, the company can't afford not to "get frantic" about the case, no matter what its public posture is, according to one lawyer hired by Microsoft.

"I imagine the stress levels are quite high. They're probably working seven days a week," said Rich Gray, an antitrust and intellectual property lawyer at Bergeson, Eliopoulos, Grady and Gray LLP in San Jose, Calif.

"No one's going to be taking vacations this summer," said Gray, who isn't working with Microsoft.

The team's "war room" is actually a series of conference rooms at Microsoft headquarters in Redmond, Wash. Some are stuffed with file boxes, while others are filled with paralegals and assistants busily combing through the company's E-mail archives and other internal documents for information pertinent to the case, according to Microsoft attorney Brad Smith.

So far, Microsoft lawyers have most likely spent the most time on the discovery process, most of which must be done by July 28, legal experts said. That is when Microsoft's formal response to the government's accusations is due to the presiding judge, Thomas Penfield Jackson.

Then, on Aug. 10, Microsoft must tell the court why it shouldn't be forced to submit to the government's request for a preliminary injunction.

Microsoft must dissect every line of the government's 53-page complaint and assign people to get evidence to refute each point, legal observers said.

For example, where the government charges that Microsoft hurts consumers by bundling its Internet Explorer browser with Windows, Microsoft will likely counter with material showing that customers want integration.

COUNTERPOINT

Microsoft must also identify evidence that contradicts its case and come up with a way to explain it.

When the suit was filed May 18, for instance, Assistant Attorney General Joel Klein pointed to seemingly damning E-mail between Microsoft executives. To combat that, Microsoft will have to look for related E-mail messages that, for example, give context to the questionable notes, said Terry F. Moritz, a top litigator at Goldberg Kohn Bell Black Rosenbloom and Moritz in Chicago.

"They will make the point that people speculate in E-mail all the time, but if a major corporate entity is about to embark on a significant undertaking — like taking over the Internet software market — E-mail isn't likely to be the only evidence of it," said Moritz, who has handled high-tech antitrust cases.

Fishing through Microsoft's E-mail is a huge task: The company processes 3 million messages per day. To help, Microsoft hired a computer forensics firm that specializes in recovering legal evidence stored on PCs, servers and backup tapes.

To track and organize that evidence, the information systems department built a document management system based, not surprisingly, on Microsoft Exchange. The system includes the documents themselves, such as memos, market research and E-mail, and a cross-referenced index of evidence.

"We've developed a certain ability to handle litigation, having had the Apple suit, the Intuit review and others," said Smith, associate general counsel at Microsoft, in a recent interview. Smith also worked on Microsoft's prior antitrust skirmish with the feds.

Hiring professional economists will be a big part of the job, said Eleanor Fox, an antitrust law professor at New York University. "They will have lawyers sitting down with economists, writing reports to take a position that antitrust intervention will harm technology," Fox said.

Microsoft officials declined to comment for this report, saying the company doesn't want to reveal its strategy. The company also wouldn't comment on whether, as the trial date nears, legal tactics will prevent Microsoft from talking freely about upcoming products and plans. That happened in the IBM antitrust case.

'A GREAT DAY'

But already, company executives and others who talk to the press are frequently coached on how to answer questions. When an important appeals court ruling in Microsoft's favor came down last month, for example, company lawyers and spokespeople alike described it in exactly the same terms: "a great day for consumers" [CW, June 29].

Legal observers said Microsoft must tone down its aggressive style for the courtroom, noting that at least one lawyer for the company has been criticized by Judge Jackson for a flippant attitude. Microsoft must be adamant in its defense but can't afford to antagonize, Fox said.

Smith and other Microsoft officials declined to specify Gates' role in the case or whether he will testify (see story at left). However, Smith said, "Bill has impressed us all as an incredibly quick study of law and legal issues. As chairman and CEO, he obviously is the person who is responsible for . . . the company's course on an important issue such as this." □

SUING MICROSOFT? GET IN LINE

Plaintiff	Accusation
AT&T	Violation of contract to share information about Windows NT
Sun Microsystems	Violations of Java license terms
Class action	Benefits wrongly denied to some temporary workers
Charles Pancerzewski, former Microsoft accountant	Wrongful termination
Two Louisiana residents	Misleading statements about Windows products

Microsoft's antitrust case by the numbers

Typical hourly rate for a top antitrust lawyer	$500-$900
Lawyers, paralegals, assistants and advisers on Microsoft legal team	About 70
Days the Justice Department will have spent gathering evidence to support its case against Microsoft, as of the Sept. 8 trial date*	736
Days Microsoft will have spent preparing its defense*	112
Days Microsoft requested to prepare*	213
Number of times Bill Gates was quoted in the press saying that forcing Microsoft to offer Netscape's browser with Windows would be like telling Coke it had to offer three cans of Pepsi in every six-pack**	165
Microsoft's federal campaign contributions in the four years before a consent decree was approved in 1995***	$117,026
Microsoft's federal campaign contributions in the three years since the consent decree was approved***	$533,703

*Includes weekends and holidays; the department began examining Microsoft's browser tactics in September 1996
**Between May 18 and June 27; Lexis-Nexis search on July 8
***Center for Responsive Politics, Washington

Should Gates take the witness stand?

By Kim S. Nash

LEGAL HANDICAPPERS say it's a tough call whether to have Microsoft CEO Bill Gates testify in the upcoming antitrust trial in September.

On one hand, Gates is adamant about defending his company, his 23-year-old baby.

On the other hand, Gates is also known for verbally shredding opponents with dismissive sarcasm — a debate tactic not likely to play well in court. In recent hearings, Judge Thomas Penfield Jackson scolded Microsoft lawyers for arrogance in the courtroom.

Gates "is indignant, which they can use to their advantage," said Eleanor Fox, who teaches antitrust law at New York University.

"As long as he's well-prepared and not antagonizing the judge, I think they will call on him," Fox said. "He's a folk figure in the U.S."

Then again, Microsoft may have no choice. Government lawyers could call Gates as one of their witnesses and, as in TV drama shows, try to goad him into showing some of his famous temper.

Microsoft officials declined to comment on whether Gates or any other executives at the company will appear. □

Chrysler soups up data access

CONTINUED FROM PAGE 1

Completed in just six months by two developers devoted exclusively to the project, the new World Wide Web-based "Do All" system lets users view everything from vehicle ID numbers and parts lists to quality and warranty data. With all that information, "they can immediately deal with legal, quality and scheduling issues," said Joanoe Franklin, a senior business analyst on the project.

BUSINESS INTEGRATION

ONE STOP

In the event of a shortage of a certain kind of brake rotors, for example, a scheduling manager could check the system to see how and where the company's 21 assembly plants would be affected, then change production schedules accordingly.

Before, users needed to sign on to 21 different mainframe-based databases and request specific reports to get a comprehensive view of the carmaker's real-time operations. After that, the raw data frequently had to be re-entered into spreadsheets.

"It was busywork to take data from the old system and then enter it into a more eye-pleasing spreadsheet," said Trish Calihan, who works as a liaison between Chrysler's information technology group and users in the plants.

Direct Web-based access to a complete mainframe database is rare, analysts said. More typical are server-based data warehouses, which provide users with a customized view of information.

But in Chrysler's case, a network of servers couldn't have handled the workload of about 1 million transactions daily while furnishing split-second response times. Furthermore, users at assembly plants in Mexico, Canada, Argentina, Detroit and elsewhere all needed fast access to that data.

It hadn't been done before, but after attending a Chrysler-sponsored technology fair and talking over the idea with a few vendors, Franklin figured it was worth a try. Chrysler used new Internet software for mainframes from SAS Institute, Inc. to create the Web-based system.

Bill Swanton, a manufacturing analyst at AMR Research in Boston, said Chrysler's Web-based system puts the carmaker at the forefront of a larger trend to make more mainframe-based corporate data easily accessible from a company intranet.

"We're beginning to see whole classes of products designed to do nothing more than help people rummage through the data that's out there," Swanton said. "The beauty of using the Web is being able to get at the information from anywhere in the world." □

Chrysler's new Web-based vehicle assembly reporting system replaces a 20-year-old batch system

How Thomas Cook's new call center will work:

- Karen, a traveler, loses her passport and dials the 800-number. She is prompted to enter a code number that brings her account history to an agent's screen.
- The agent has access to Karen's frequent-flier record, a list of hotels she's stayed in, what language she speaks, whether she is a premier member, whether she prefers aisle or window seats, her passport number and other travel preferences.
- The agent notices Karen made an E-mail inquiry earlier regarding an exchange rate. The agent answers the currency question and orders a passport replacement.

Call center reorg

CONTINUED FROM PAGE 1

will use Java-based clients to access the system.

Thomas Cook's planned unified customer view is an early sign that service-based companies will need to move away from setting up call centers according to services such as, in Thomas Cook's case, currency exchange and emergency traveler's aid, observers said.

With more people traveling than ever, the introduction of the euro currency next year and the increasing globalization of business, the company saw a "virtual call center" as a logical way to improve service and meet customer needs, said Mike Hughes, chief information officer at Thomas Cook in London.

"It's cost efficient for us," Hughes said. For one, the service brings together travel arrangements and services such as currency exchange, enabling them to cross-sell services and offer special deals to customers from one point of access.

The system also will give Thomas Cook more flexibility to change its offerings to customers. If the company wants to offer free passport replacement as a promotion, it can quickly change the back-office application as well as the graphical user interface on an agent's machine.

The $3.3 billion call center industry is changing, with corporations such as Thomas Cook and American Express Co. spending big bucks and renaming their call centers with the more encompassing term of "contact centers," said Art Schoeller, an analyst at Gartner Group, Inc. in Stamford, Conn.

Although only about 10% of U.S. corporations are testing such systems now, organizations that can't handle voice, E-mail, Web transactions and chat sessions on one system by 2001 "will not be competitive," Schoeller said.

Service-oriented businesses dependent on communicating with customers will need to consolidate those communications in one central place, he said.

Thomas Cook's project will build three new call centers to replace the 15 function-based call centers its has now. The company, which posted $1.8 billion in revenue last year, plans to build three 24-hour customer contact centers in Europe, Asia and the U.S. that will handle calls globally and support 30 languages.

The company is spending $40.7 million on the project, Hughes said. The prime vendor, Chordiant Software, Inc. in Palo Alto, Calif., is providing the call center technology and MCI Systemhouse is providing the telecommunications services.

Entering this enterprisewide customer management area beside Chordiant are Aspect Telecommunications, Rockwell Electronic Commerce and IBM.

In the call centers, agents will be able to use their computers to access the last inquiry made by a customer — whether it was an E-mail request made on the Web site or a telephone call. Web inquiries will be "pushed" to a central depository.

The system is expected to cut training time, which analysts said typically represents 70% of call center operating costs.

The call center opens Tuesday in Peterboro, England, and will be staffed by 170 agents, each of whom is expected to handle 150 calls daily. □

Compaq slices Alpha server prices

By Jaikumar Vijayan

COMPAQ COMPUTER CORP. this week will roll back system prices by as much as 30% and memory prices by up to 50% across its high-end Alpha server lines.

The move, Compaq's first major Alpha server pricing action since acquiring the technology from Digital Equipment Corp., will drop the price of an Alphaserver 8200 running Windows NT from $142,000 to $118,300.

Similarly, a top-of-the line NT-based Alphaserver 8400 TurboLaser system, which had a starting price tag of $362,000, will sell for $301,000, *Computerworld* has learned.

At 50%, Compaq's Alpha server memory price cuts are even steeper. A 4G-byte board will sell for $65,000, or $16 per megabyte.

Though the moves will benefit Alpha users in all environments — Alpha supports Windows NT, Unix and OpenVMS — it is particularly targeted at the OpenVMS base that comprises nearly half the high-end Alpha installed base, said Terry Shannon, editor of "Shannon Knows DEC," an Ashland, Mass.-based newsletter.

"It is a sign that they want to push OpenVMS at the high end," Shannon said.

The price cuts could also mean that Compaq is making way at the high end for a new server based on the next-generation Alpha 21264 chip, codenamed EV6, Shannon said. Before it was acquired by Compaq, Digital was working on a 32-processor Alpha server based on the new chip. The chip itself is expected to be announced by year's end, though servers based on it aren't expected to ship until early next year.

Also in the cards is a midrange Alphaserver codenamed Regatta and an OpenVMS server partitioning technology called Galaxies Software Architecture, both of which are slated to be announced this fall. □

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Dispatches & images from the fringes of the electronic frontier

MILLENNIUM CLOCK
The Red Sky Millennium Clock is a
Java utility (download
from www.millennium.redsky.com)
that queries an atomic clock to
provide the precise time and
countdown to 2000. The elegant
650K-byte applet, developed by
Red Sky Interactive in San Fran
cisco, also gives an accurate ren-
dering of the Earth's rotation.
4 8 5 0 9 0 1 5

Patent watch

Recently issued U.S. patents (number, inventor/assignee, date)

Cow-milking robot apparatus. It includes an animal identification system that senses when a cow has entered the milking stall, a robot that automatically connects the milking cups to the cow's teats and a computer controlled feeding system to keep the cow contented during the milking process. (5,769,023, Maasland N.V. in the Netherlands, June 26)

Electronic sensors in a car that determine whether someone is occupying a particular seat. In the event of a crash, the deployment of air bags could be tailored to the occupants' positions. (5,770,997, AlliedSignal, Morristown, N.J., June 26)

Casino operating and surveillance system controls the flow of money and monitors games to eliminate cheating and dealer skimming. (5,770,533, John Franco Franchi, Washington, June 23)

Source: MicroPatent (www.micropat.com)

Avoid nasty download surprises

Grab the Download Calculator (*www.intel.com/home/club/dlc.htm*), a pop-up utility, to see how long it will take to download an Internet file.

THE FIFTH WAVE

BY RICH TENNANT

"Oh, jeez! I hate when you fish out toasted chips with a butter knife!"

E-Mail Rich Tennant at the5wave@aol.net

Inside Lines

Intel responds to FTC complaint

Intel is expected to file a response today to the Federal Trade Commission's antitrust complaint against it. The filing is the first step that will allow a trial date to be set. In a scheduled meeting Friday, Intel and the FTC differed over trial dates, with Intel requesting a date in February 1999 and the FTC asking for one this December. A judge will decide on the date soon.

Windows 98 publicity redux

Microsoft may be throwing its weight around regarding problems with upgrading to Windows 98. A source at one PC maker said Microsoft officials are "quite unhappy" with some vendors' warnings about Windows 98 upgrade installations crashing users' systems. As a result, Microsoft has been pressuring some PC makers to back off on these warnings about Windows 98. At press time, Web sites for Dell Computer and Toshiba America Information Systems maintained their user advisories regarding Windows 98.

IF (Y2K) THEN REPEAT (PANIC)

You know about Y2K, the millennium bug. Now meet IF2K. "Financial firms in Asia are far more concerned with whether they survive until 2000 — an issue we have named IF2K — than Y2K systems issues," Tanya Styblo Beder, an analyst at Capital Market Risk Advisors in New York, told a Senate hearing last week. The problem is that if Asian banks pour all their resources into surviving the current economic crisis, they'll reach the end of 1999 with no Y2K fixes in place and trigger a whole new financial crisis.

Y2K: The wrath of God

Meanwhile, another analyst warned the Senate that Iraq's Saddam Hussein will interpret year 2000 computer problems "as retribution from an almighty aimed at punishing technological infidels." John Westergaard, editor of the "Westergaard Year 2000" online newsletter, said Saddam will attack Kuwait and Saudi Arabia in early 2000, believing — with good reason — that Y2K problems will leave the U.S. military incapable of mounting a large-scale military response. Westergaard recommends that the Department of Defense move troops into the region in late 1999. Oh, and fix its Y2K problems, too.

Tick . . . tick . . . tick . . .

And for those who can't bear not knowing precisely how far behind their year 2000 projects are, Acimex Corp. in Northfield, Ill., boasts nine, count 'em, nine timepieces to help the date-dependent track the days, hours and minutes to the next century. Models range from the "superdeluxe" desktop pyramid model to a keychain version that features a scrolling calendar. And if you're losing sleep over Y2K, there's also the CK-232 Year 2000 alarm clock, whose countdown mechanism will switch from days to hours within a week of the big date.

Now hiring: 47 wrkdys/yr, grt bnfts

Software development guru Capers Jones has a solution to the IT labor drought: write better software. About 60% of U.S. programmers are busy fixing errors that could have been avoided, according to Jones, chairman of Software Productivity Research in Burlington, Mass. And after factoring out weekends, holidays, sick time, meetings, training, projects that are doomed to failure and all that repair work, "only 47 days of the year are available for actual software development," Jones says.

How do you trigger a group hug in SQL? Oracle executives are paying so much attention to its sluggish applications business these days that some folks laboring on the database side of the company have started to needle Oracle President Ray Lane. "I'm getting messages and calls from [them] saying, 'Don't you love us anymore?' " Lane sighed. News editor Patricia Keefe loves each and every one of you, and you can respond to her warmth with news tips and tidbits. E-mail her at patricia_keefe@cw.com or call (508) 820-8183.

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